# REMINERALIZE THE EARTH

*Regenerating our soils, forests and health*

*RECYCLING MINERALS with finely ground gravel and rock dust*

ISSUE 9 Spring 1996 • NORTHERN HEMISPHERE

## REMINERALIZE THE EARTH BEGINS TWO-YEAR RESEARCH PROJECT

## SPECIAL FEATURES

SARA BRUCK'S SCIENCE PROJECT WINS HONORS– *With* REMINERALIZATION *For* MAHOGANY TREES

FIRST INTERNATIONAL PROJECT TO UTILIZE SR TO REDUCE $CO_2$ PLANNED FOR COSTA RICA

CREATING AN AWARD WINNING CHAMPAGNE IN BRITISH COLUMBIA WITH SR

Fall 1996 • SOUTHERN HEMISPHERE

# REMINERALIZATION BEGINS WITH *YOU*

## Heal Yourself
## Heal The Planet

CELL TECH 1300 MAIN STREET
KLAMATH FALLS, OR 97601

# REMINERALIZE THE EARTH

*Regenerating our soils, forests and health*

*RECYCLING MINERALS with finely ground gravel and rock dust*

This magazine is a reflection, forum, round table of ideas, experiences and research of those concerned with networking and implementing soil remineralization. Articles, letters, and photos are welcome and appreciated. We reach an emerging grass roots community network around the world.

**EDEN OR ICE AGE**
***Which Will We Choose?***

The book *The Survival of Civilization* by John Hamaker and Don Weaver is regarded by a growing movement worldwide as a blueprint for the survival of the Earth, restoring ecological balance and, perhaps, even recreating Eden.

The remineralization of forests, farms, orchards and gardens with glacial gravel and rock dust is nature's way to regenerate and fertilize soils. During an Ice Age, as glaciers grind rock to a fine dust over millennia, a fertile soil is created. Adding finely ground gravel dust to soils is a tremendous boost to organic agriculture and can make it truly viable by adding up to a hundred elements and trace minerals needed by all life and by nourishing the microorganisms in the soil, whose protoplasm is the basis of all living things.

There is evidence to suggest that as forests begin to die off worldwide, giving off carbon dioxide, the climate of the Earth is altered, triggering the transition from the warm interglacial to an Ice Age. We are hastening this process with the burning of fossil fuels. Undertaking the task of remineralization is urgent to restore our agricultural soils and to save the dying forests in the temperate latitudes and stabilize our climate.

**On The Cover**

*The two major features of this issue are dedicated to remineralizing forests in the tropics – from high school science projects to international projects, including tropical agroforestry and tree farming with mahogany and Klinki pine – to the aim of re-establishing biodiversity and restoring the carbon balance of the Earth and its atmosphere.*

**Publisher/ Editor:** *Joanna Campe*
**Associate Editors:** *Zhenya Delate, Jennifer LeJeune* ◆ **Layout:** *Joanna Campe* ◆ **Regular Contributors:** *David Yarrow, Don Weaver, Robert J. Able and Dan Hemenway* ◆ **Cover Design:** Joanna Campe ◆ **Subscriptions:** *Jennifer LeJeune and Bonnie Barclay*

**© 1995 *REMINERALIZE THE EARTH***
152 South Street, Northampton, Massachusetts, 01060-4021 U.S.A.
Tel: (413) 586-4429, Fax (413) 586-6064
E-mail: ReminEarth@aol.com
ISSN 1066-4106, three issues/year. **Membership rate** $15-$25.00 for First Class for three issues in the U.S. and $30.00 foreign. For more membership information see inside back cover. Printed with soybean ink on recycled paper by Common Wealth Printing in Hadley, Massachusetts.

# *Remineralize the Earth* magazine

*is published by*

***Remineralize the Earth, Inc.***
***Towards a Sustainable Agriculture, Forestry and Climate***

*a non-profit organization incorporated to disseminate ideas and practice about soil remineralization throughout the world.*

***Remineralize the Earth*** *networks to a community grass roots network that stretches to every continent. Paying a higher rate allows us to donate copies to Peace Corps volunteers and others in Latin and South America, Asia, Africa and countries in eastern Europe and the Russian republics where sending U.S. currency is not affordable, and to generally expand our outreach.*

***BECOME A MEMBER***

*Membership includes three issues sent periodically (aim 3 per year). Funding and support are needed to expand this work and its international outreach. Please join with us in the work towards creating a sustainable future.*

***$15 Student/unwaged membership***

***$25 Individual/family membership***

***$30 Subscription outside the U.S.***

***$50-100 Organizations/corporate***

***$250 Supporting membership***

***$500 and over Patron membership***

***Contributions should be sent to:***

*Remineralize the Earth*
*152 South Street,*
*Northampton, MA 01060 U.S.A.*

*Contributions over $15.00 are tax deductible.* ***Remineralize the Earth, Inc.*** *is a 501(c)#3 tax-exempt organization.*


## On Remineralizing Soils

*Microorganisms produce the protoplasm of all living things. Microorganisms themselves feed on the total mixture of minerals and gases in the biosphere and are energized by carbon. We can build enormous per acre tonnages of protoplasm into the soil in a very short time – enough so that sun energy reaching the plant becomes the limit of growth. The foods of microorganisms are the cheapest raw materials on Earth.*

***John Hamaker***
***The Survival of Civilization***


## Remineralize the Earth, Inc.
## *Towards a Sustainable Agriculture, Forestry and Climate*

### Board of Directors

***Joanna Campe,*** *President,* ***Christian Campe,*** *Treasurer,* ***Robert J. Able,*** *Chairman, National Aggregate Association Task Force on Soil Remineralization,* ***Robert Bruck, PhD.,*** *Research Administration, North Carolina State University,* ***William C. Holmberg,*** *President, American Biofuels Association,* ***Alex MacPhail,*** *Director, Earth Arts Institute,* ***Greg Watson,*** *Director, Dudley Neighborhood Initiative,* ***Susan Witt,*** *Executive Director, The Schumacher Society,* ***Tara Zadeh,*** *MA Dept. of Food and Agriculture*

### Board of Advisors

***William Fyfe, Ph.D.,*** *President, International Union Of Geophysical Scientists,* ***Ward Chesworth, Ph.D.,*** *University of Guelph,* ***John Todd,*** *Ocean Arks International and The Center for Restoration of Waters,* ***Larry Patrick, Ph.D.,*** *Sustainable Systems, Slippery Rock University,* ***Dr. Herster Barres,*** *Klinki Forestry Project for Costa Rica,* ***Bob Cannard,*** *Cannard Farms,* ***Andrew Euston,*** *AIA, HUD,* ***Susanna MacKenzie Euston,*** *Community Sustainability Resource Institute,* ***Betsan Coats,*** *Snowball Plea, Australia,* ***Barrie Oldfield,*** *Men of the Trees, Australia,* ***Dan Hemenway,*** *Yankee and Elfin Permaculture,* ***Alden Bryant,*** *President, Earth Regeneration Society,* ***Dr. Gerald Olarsh,*** *Naturopathic Research Laboratories,* ***Don Weaver,*** *co-author of* The Survival of Civilization

# CONTENTS

## SPECIAL FEATURES


- **Soils, Planet and People** 7
  *by Don Weaver*
- **Frequently Asked Questions** 8
  *by Robert J. Able*
- **Klinki Forestry Project for Costa Rica** 14
  *by Joanna Campe and Dr. Herster Barres*
  *International project to stabilize the climate will trial SR*
- **Remineralize the Earth Receives Grant** 17
  *by Jennifer LeJeune*
- **Can Remineralization Save the Tropical Rainforest?** 18
  *by Sarah Bruck*
  *High School SR project wins NC State award*
- **NY Grape Grower Conducts Field Test on Glacial Rock Dust** 23
  *by Robert J. Able*
- **Summerhill Estate Winery** 24
  *by Joanna Campe*
  *Remineralized wine wins international awards in British Columbia*
- **Long Term Reclamation Study: Hopkins County, KY** 26
  *by Dr. Terry J. Logan, Billie Harrison, Lori Goins*
  *N-Viro sewage sludge with cement kiln dust restores degraded soils*
- **National Aggregate Association Update** 28
  *by Rick Meininger*
  *December, 1995 meeting in Beltsville and research studies*
- **Selecting Sites for Remineralization** 30
  *by Deborah A. Kramer, U.S. Bureau of Mines*
  *A GIS Model defines potential users of rock dust*
- **Glacial Flour** 33
  *by William Peavy, Ph.D*
- **Arbor Day Celebration at Belmont Library** 34
  *by Don Weaver*
- **Trace Elements: Missing Links** 36
  *by Dr. Earp-Thomas with Commentary by David Yarrow*
- **Secret Solutions for Health** 37
  *by David Yarrow*
- **Planters II – A Unique Source of Minerals** 40
  *by Jack Watkins*
- **Digestit Digests Odors** 41
  *Zhenya Delate looks at a Leland Taylor Report*

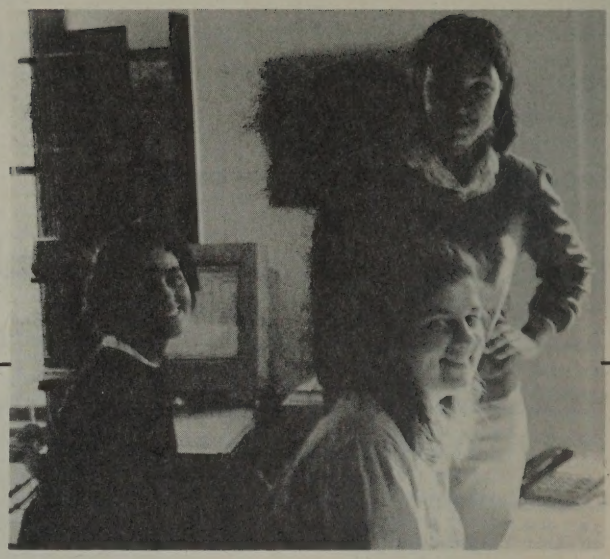

## REGULAR FEATURES


- **Letter From *RE*** 6
- **Grapevine** 10
- **Book Reviews** 42
- **Letters and Forum** 43
- **Network List** 48
- **International Gravel Source List** 50
- **Resources** 54
- **Subscriptions** 55


## AD INDEX


Acres USA..... 52
Agronics Inc..... 40
Australasian Health & Healing.... 53
Catalyst..... 49
Cell Tech..... 2
Commonwealth Printing..... 54
The Enlivened Rock Powders..... 36
Eyeland Publications..... 49
Gernatt Gravel..... 23
Kahane/RD in Oregon..... 40
K-IDA-AG..... 36
McKenzie Rock Flour..... 33
Mineral Rite..... 46
Moosegrower's Supply..... 27
Mosaic Soil Co..... 27
Peak Minerals/Azomite..... 32
Planters II: Judy Roylance..... 40
Planters II: US Soils..... 22
PROD..... 49
Snow Pond Farm Supply..... 27
Spiral Stonemeal..... 34
Tracelyte..... 39
Worm Digest..... 49

# Letter from *Remineralize the Earth*



*Interns Jennifer LeJeune (left) Zhenya Delate (standing), and Bonnie Barclay*

You will probably have noticed an initial difference on the opening pages of ***Remineralize the Earth*** (***RE***). ***RE*** has incorporated as a non-profit with 501(c)3 status, which allows us to become a membership organization and to accept grants and contributions. This is thanks to a seed grant from the Massachusetts Society for Promoting Agriculture and I feel tremendously grateful to them.

This has made it possible to work with interns from local colleges as a part of the federal work study program. Students develop work experience and skills related to their field of study and in community service.

Zhenya Delate of Smith College, Jennifer LeJeune of Mt. Holyoke College and volunteer intern Bonnie Barclay of the University of Massachusetts have spent their spring semester working with ***RE*** and what a difference it has made!

***RE*** has received a research grant for a two-year study on remineralization recently approved for funding by the Massachusetts Society for Promoting Agriculture, the National Aggregate Association, the National Stone Association and the Aggregate Foundation for Technology, Education and Outreach.

For assistance in creating this proposal I would like to thank Alex MacPhail on ***RE's*** Board of Directors who began, encouraged, and inspired it's development; Trustee Ned Roberts for his support and dedication to the funding process; along with Robert J. Able and Rick Meininger of the NAA; Professor Allen Barker of the University of Massachusetts, researcher of the project, and Ed Maltby and the staff of Smith Farm Vocational School. I would like to express my gratitude to the NAA, NSA, AFTRE, and the MA Society for Promoting Agriculture for their support of this project.

***RE*** has set a goal of expanding its subscriber/membership base to 2,000, expanding fundraising efforts, and building a website on the Internet which would provide potentially millions of people with access to information about soil remineralization (SR).

We are entering a new stage that will allow us to expand our education and outreach. Suggestions and volunteers to help reach these goals are appreciated. Please contact us.

Joanna Campe

## Introducing RE's Staff

**Jennifer LeJeune**

*I spent the first few weeks of my senior year at Mount Holyoke College combing the area for opportunities to work on a sustainable agriculture project. I heard about rock dust through an area organic farmer who brought me to the door of **RE** and here I am. I am very happy to be learning, writing, and spreading the word on remineralization.*

**Bonnie Barclay**

*I was looking for work outside of school on something to do with the Environment. I wanted to see what my future might have in store, and looked through a list of internships. I discovered **RE** and was intrigued that someone would create a magazine about soil. I got excited that someone thought 'we should stop treating our soil like dirt' and here I am getting a soil education like no other.*

**Zhenya Delate**

*I was on the Big Island of Hawaii this fall past, staying with my aunt, a sustainable agriculturist. I wanted to gain experience in sustainable farming methods, so she suggested I work on a colleague's organic farm. The farmer used rock dust and gave me my first issue of **RE**. It helped me put my thoughts together concerning what I want to do with my life.*

*I have decided to major in Soil Chemistry and minor in Environmental Science. Coincidentally, **RE** is published in the town of my dream school Smith College! I was accepted into Smith and interning at **RE** fell into place. So here I am, learning a lot, and knowing it is Fate.*

# Remineralizing Soils, People and Planet

*by Don Weaver*

## *Nature's own SR*

Organic agriculture has long emphasized the need to return organic matter such as compost to the soil, and all compost ingredients have some minerals in them. However, to remineralize soil generously with the full spectrum of mineral elements found in the world's richest soils, it it necessary also to restore the rock minerals from which soil is originally derived. "The rock is the mother of the soil" is how one geologist of the 1800s put it. Since the most fertile soils usually have a variety of types of "parent rocks" it seems wise to try to duplicate the natural process when we remineralize.

The Hunza Valley soils, for example, have grown some of the best crops of fruits, vegetables and people for centuries. They are irrigated two or more times a year with the glacial gravel dust found in the Ultar Glacier meltwater, treasured as "glacial milk." Glacial action has produced much of the Earth's fertility as glaciers normally grind and mix together rocks of broad variety and element content from the large areas they work over with their crushing mass. Some volcanically derived soils, such as in those in Java, can also be very fertile, although it is the areas like Hunza and where glacial and alluvial (river-carried) soils form from mixed rock types that nourish the legendary longevity of the people there.

## *SR 2000 years ago*

According to E.B. Szekely in his writings on the Essenes in the *The Ecological Health Garden*, they may have been the first health-conscious people to pulverize rocks to add to their composts, gardens and orchards around 2000 years ago. Having little in the way of volcanoes, glaciers or perhaps even silt-rich rivers in the Dead Sea region, the Essenes apparently found a way to create rock dust without the kind of machinery which we have now.

After J. I. Rodale, founder of *Organic Gardening* magazine, visited Hunza in the 1940s, he wrote *The Healthy Hunzas*, which included a chapter on rock powder. He urged that we learn from their great example and grind up the billions of tons of rock needed to remineralize soils in this country. *(editor note: Fortunately it is already ground up and available as a by-product of the aggregate and stone industries.)*

## *How it works*

Soil remineralization with rock dust feeds the soil microbes and worms the essential minerals which they require in building their protoplasm and enzymes. If we want mineral-rich and enzyme-rich live foods, then we need to ensure that we or those who grow our food have provided these soil workers (the "real farmers", as some have noted) their complete natural diet: organic compost, mulch, etc., and rock minerals. If you can do this in your own garden and orchard and eat fresh, living, mineralized produce, you can give thanks because you're living in Paradise! Not quite, you say? The air is still sick, the water is in trouble, the forests are on the way out, and haven't you noticed how weather and climate are changing, you reply?

Perhaps you are right. Perhaps a little island of paradise isn't the Paradise we know the Earth is meant to and can be. However it is something we can all do if we set our hearts and hands to it, and it may be the best and only way to reverse the degenerative spiral toward Paradise Lost and help our fellows glimpse how near Paradise Restored can really be. Never underestimate the power of an enzyme! Or the Spirit of Love when given to Mother Nature and to her human children. A taste of real super-delicious living food from rich remineralized soil is one way to offer that "glimpse" – and there are few things more inspiring and soul-nourishing than a garden and orchard in bloom and fruition.

---

*Don Weaver is a gardener/ecologist/writer/networker who, with John Hamaker, co-authored* The Survival of Civilization *and has edited* Solar or Ice Age? Bulletin, numbers 1-10. *He contributes to and helps distribute* **Remineralize the Earth** *magazine, and is encouraging establishment of "Earth Regeneration Centers" and farms worldwide. He has enjoyed a 100% organic living foods diet for 18 years, and welcomes communication from interested friends and co-workers. Write c/o Hamaker-Weaver Publishers, POB 1961, Burlingame, CA 94010 or phone (415) 347-9693.*

# Frequently Asked Questions

## by Robert J. Able

*SR – Soil Remineralization*

**Approximate Application Rate Conversions**

| | | | | |
|---|---|---|---|---|
| 3 tons per acre | = | 14 lb. per 100 sq. ft. | = | 1.25 lb. per sq. yd. |
| 10 tons per acre | = | 46 lb. per 100 sq. ft. | = | 4 lb. per sq. yd. |
| 20 tons per acre | = | 92 lb. per sq. ft. | = | 8 lb. per sq. yd. |

***What is soil remineralization?***

Over the years, surface soils have been depleted of many valuable and necessary nutrients (elements) due to acid rain, acidic fertilizers and repeated crop growth consumption of elements.

Contemporary agricultural practices do not replace many of these lost elements.

Freshly ground rock contains elements and trace elements that can be returned to the soil for plant optimum growth.

***What are the advantages of applying rock dust?***

- Restores lost minerals and trace elements to the soil
- Increases the nutritional value of food and feed crops
- Increases crop yield
- Increases plant resistance to insects and disease
- Increases the humus complex of soil
- Enhances microbial activity and earthworm populations
- Enhances the flavor of fruit and vegetables
- Aids soil moisture retention
- Aids the development of better root systems
- Reduces weather susceptibility of plants (hardiness)
- Reduces soil erosion
- Reduces plant mortality rate during transplant
- Reduces a plant's need for soluble chemical fertilizers
- Reduces health problems associated with residual toxic herbicides and pesticides by reduced application rate
- Reduces soil and water contamination by a reduction in the need for herbicides and pesticides
- Provides a product consistent with the goals of sustainable agriculture

***By what mechanism do these fine rock product particles become available to plant root systems?***

- Ingestion, digestion by macro-organism's intestinal tracts (e.g. earthworms, moles, etc.) and their resultant castings
- Microbial attack on the surface of fine particles
- Dissolution by root exudates, acid rain leaching, and acid fertilizer leaching
- Direct ion exchange by highly charged particles as a result of the magnetic charge imparted during the crushing operations

***Where can I obtain the name of company facilities and phone numbers for producers in a given area?***

- Contact your local sand and gravel producers
- Contact your local state Aggregate Producers Association
- Contact your local county DPW (Department of Public Works)
- Contact your state DOT (Department of Transportation) Materials Bureau
- Contact the National Aggregate Producers Association (Tel: 301- 587-1400)

***What does industry call the product?***

- Pond settlings
- Rock dust
- Rock flour
- Classifier tailings
- Minus #200 mesh

***What should I ask for?***

- Minus #200 Mesh (-75 micron) material
- Pond settling
- Material that has gone over the weirs of a sand screw or the weir of a sand classification tank
- Material obtained from the dust collection system

***What shouldn't I use?***

- Concrete sand
- Abrasive sand
- Filter sand

---

*Robert J. Able is Sales Manager at Dan Gernatt Gravel Products, Inc. in Collins, NY. Mr. Able is Chairman of the Center for Aggregate Research Task Force T-6 Remineralization and the National Aggregates Association Sub-Committee on Remineralization.*

- Mason sand
- Blow sand (loess)
- Screenings

Note: All above are too coarse

***What is the best material to use?***

- It is best to tailor rock dust elemental analysis to provide elements that are deficient in soil, if known.

- Glacial sand and gravel that contain a myriad or heterogeneous combination of various rock formation type or mineralogy is preferred.

- Other metamorphic or igneous stone such as basalt, rhyolites, etc.

- Most sedimentary rocks (limestone and dolomite) are used to balance pH and provide for calcium and magnesium deficiencies.

***What percent should pass a #200 mesh?***

- At least 75% to 100% should pass a #200 mesh.

***Can the material be too fine?***

- Yes, material in a tertiary (3rd settling pond) settling pond may contain too much clay colloidal material.

***What does this material cost?***

- F.O.B. "bulk" prices will range from $0.50 to $5.00 per ton or $0.75 to $7.50 per cubic yard.

- Transportation costs range between $0.10 to $0.15 per ton per mile; e.g. an order of 20 tons to be delivered 20 miles away would cost between $40 and $60 per truck load.

***How much should I use?***

- Normally between 5 – 20 tons per acre, depending upon the soils to be treated and the fineness of the product used. The finer the product, the more responsive it is and the less you need for immediate response, although you may need to apply it more often.

***Can small quantities be obtained?***

- Some companies are containerizing their products; others will containerize at your request.

- Anticipate much higher costs when the product is containerized due to labor costs associated with handling in this manner.

***Is this material dry or damp?***

- At most locations, this material will be stored outside in a damp or weather conditioned state.

- Normally the material will have the consistency of damp earth with a residual moisture content of around 15% ± 5%.

***What equipment do you need to spread it?***

- Shovel for small areas
- Wet agricultural lime spreaders
- Manure spreader
- If equipment is available that contains an agitator (to maintain particles in a suspended state), a wet spray can be used.

***Should the material be worked into the soil?***

- Yes, if possible the material should be blended into the soil so that the plant root system can have access to it.

- It can be applied to the surface; however, the effective utilization period may take longer.

***How often do I have to apply the material?***

- Depending on fineness, chemical analysis and initial application rate, an application should be good for 3 to 6 years.

***Do organic farmers have to be concerned about any products used by the industry during the processing?***

- A few operations may use a flocculating agent to assist in settling out of solids in a clarifier or settling pond. These are products used to develop attracting electrical charges. The user may wish to obtain an analysis of the product being used.

- A few operations may use a dust suppressant for environmental mandates. The user may wish to ask for information of the product being used.

- Most operations do not use either of these products.

***Can some rock types have an elemental analysis that in large application imparts toxicity to the soil?***

- Though rare, it is a possibility.

***Does the USDA approve or disapprove of this material as a soil amendment or supplement?***

- At this time, the USDA does not sanction or disapprove of the use of these materials.

- They are currently studying various material and combination of materials at their Beltsville, Maryland test facilities.

***Where do I obtain an elemental analysis of the Minus #200 mesh material and what does it cost?***

- It is suggested that an ICPM analysis be made. One of the many companies with this capability is:

**Elemental Research, Inc.**
**303-267 West Explanada**
**North Vancouver**
**BC V7M 1A5 Canada**
**Phone: 604-986-0445**

The test costs about $120 (U.S.) per sample. Less than 1/2# of material is required for the test.

# The Grapevine

## *SR Everywhere...*

### News from Men of the Trees in Western Australia

*A recent letter from Barrie Oldfield, President of Men of the Trees:*

The National Conference of the Institute of Quarrying was held in Perth in October 1995. Men of the Trees were invited to join the trade display so we were rubbing shoulders with the really big boys in mining and quarrying. Our purpose was quite different from most, however. We were looking at those vast piles of under-exploited material that every quarry must make room for, and our story, one of improved agriculture, of fast growing tree seedlings for environmental repair, roused considerable interest among the quarry owners there. The Conference also featured a talk by Sam Catalano whose very scientific approach to the use of Min-Plus, his basalt dust from a quarry in northern Queensland, made delegates sit up and take notice. Between us we held a constant stream of inquiries throughout the three-day event.

Amery Acres crop last season was Lupins. We harvested the crop in early December and yield results were very interesting. The plots treated with granite dust actually gave us the heaviest harvest of all. Neomin and NPK chemical fertiliser gave us the heaviest yield of total green matter which was measured in mid season but the NPK also brought on more weed competition. The Department of Agriculture regards the results as so slender that it would be premature to say there had been an effect, let alone a beneficial effect through the rock dust.

For the coming season we will work over these same plots again, topping up the treatments and adding a further two plots using a basalt dust obtainable from Pioneer Quarries at Belorup, a quarry just 210 km south of Perth. For 1996 we will return to the wheat phase of the crop rotation for the trial plots whilst we will sow our lupin over the uncropped land from 1995. By the way, this variety of lupin flour contains 26% protein, all of which are very digestible and beneficial to health.

Our tree seedlings this year are looking fantastic. They were grown with a range of grades of granite dust mixed into the potting mix on the ratio one part rock dust to 20 parts regular potting mix by volume. The seedlings so treated are streets ahead of seedlings on neighbouring benches, all seeded about the same time.

These trials were suggested as a result of experience of working with Maria Felsenreich and Monika Neumayer, who visited us last November. Maria used all grades of dust but several times even selected 'nugget-sized' stone from the quarries. This would be crushed stone of 5-10 mm size. Maria's contention is that rock dust is able, through the waterbodies in plants, soil, and atmosphere, to protect living organisms from radiation stress. In Australia this emanates largely from the sun as a result of reduced ozone layer protection. We are currently trying to devise field experiments to demonstrate this to scientific standards of enquiry. The seedling trial in St. Barbe Grove nursery (and another at Lesmurdie) was just a first step in this direction.

During the visit of Felsenreich and Neumayer a number of lectures and workshops were held. As a result a new group has been established especially to follow these lines of enquiry and draw more people together concerned with the radiation neutralizing properties of rock dust. The Natural Resonance Study Group is chaired by Anne Miller, 23 Morley St, Maddington, WA 6109, Australia.

### SR Conference In Tasmania

Sheena McDuff organized a conference on rock dust in agriculture and forestry for the Tasmania Organic Producers Society (TOPS) in Dover, Tasmania, on October 30, 1995.

Keynote speakers were Charles Peaty, founding President of Men of the Trees in Western Australia, and Sam Catalano, Director of Pacific Mineral Development Ltd., producers of MinPlus of Innisfail, Queensland. Charles Peaty's great strength is in his understanding of forestry and especially the fast establishing of woodlands in arid countries. As a forester with this experience he was just the fellow to start Men of The Trees. His professional work involves plantation establishment on private land, farmlands and degraded rangelands, over much of Western Australia.

Maurice Finkel is editor of *Australasian Health and Healing,* a quarterly magazine which regularly features rock dust articles. He also donated a full-page advertisement space to the video of the Dover Conference. The film, taken over a period of three days is available from: MPTV, P.O. Box 9, Perisher Valley, 2624 NSW, Australia. The cost is Australian $30.00 postpaid.

Some memorable quotes from the seminar:

*The last ice age missed Australia, therefore our soils have been devoid of minerals for thousands of years.*

*Australian soils are going acidic at the rate of 1% a year.*

*Australia imports one billion dollars worth of chemicals for soil fertilisation per year. Only 50%*

*are used up by the plants, the rest go into waterways, etc., causing unnecessary pollution.*

***Sam Catalano***

*Farmers on the eastern side of a quarry at Shap, North-West U.K. benefit from the westerly winds which blow the quarry dust from the Shap quarry over their crops. These farmers claim that they have no need for commercial fertilisers for they receive free fertilisers on the winds coming from the quarry operations.*

***Charles Peaty***

## Rock Dust for Fire Prevention

Sheena McDuff sent a letter to the editor of the "Bush Telegraph" in Dover, Tasmania citing rock dust as a means to fire prevention of bush/forest fires. McDuff reports: 1) Insects are attracted to already weak plants which are ready to be turned to bog, such as bogs in Ireland, Tasmania, and Siberia. The brittle plants are attacked by insects which are playing their part in the return to the bog process. 2) Lightening strikes are attracted to weak plants, which also helps the return to bog process by starting fires.

Because generally trees are brittle due to trace element lack, remineralisation can get the green sap flowing again by supplying vital trace elements in compost or mulch. S. McDuff, C/-Dover Post Office, 7117, Tasmania, Australia.

## SR Gains Strides in Scotland

A report on *Soil Remineralization and the Use of Rock Dust* by Anna Collins was released in January of 1995 by the Henry Doubleday Research Association. Moira and Cameron Thomson of the Earth Regeneration Centre in Dundee, Scotland provided the central information to Ms. Collin's report. (See Book Review page 9).

The Thomsons and the Earth Regeneration Centre also made national newspapers and Scottish TV news this summer. Moira and Cameron are working with the District Council who have their own quarry and basalt for roads. The Earth Regeneration Centre, 3 Cottage, Scotston Farm, Auchterhouse, Dundee DD3 OQI.

## SR Research in Cameroon

MWOUTHIO David Guimolaire is a doctorate student at the University of Yaounde, Cameroon and the topic of his thesis is remineralization of soils with volcanic basalts. His work is being supervised by Professor Tchoua Felix of the University's Department of Earth Science.

The theme of his research is *The Tombei graben volcanism: geological study of volcanic projects and their agricultural importance.* The Tombei graben is a large fault of a volcano of tectonic origin about 45 km long and 20 km wide situated on the northern part of Mount Cameroon in Central Africa, with an area of about 800 square kilometers. The region has been the seat of recent fissural volcanic manifestations that have provoked the outpour of basaltic lava flow, followed by a development toward more explosive phases responsible for the growth of about 115 scoria cones.

The Tombei graben volcanoes have produced basaltic lava of homogeneous mineralogical composition (olivine-pyroxine-Caplagioclase-oxides). Geochemical data indicates that the lavas come from the partial melting of the mantle followed by the beginning of a fractional crystallization. Fertility experiments with pyroclastic products on initial corn growth suggest that the fine volcanic products can supply magnesium (Mg) and calcium (Ca) to plants and rejuvenate poor soils.

The work will encompass a microphobic study of minerals on polished thin sections, fertility experiments with other plants, experiments on the mineralization rate of basaltic pyroclastic rocks and a bibliography. The aim of the study is to determine how pyroclastic projections can be used as natural fertilizers of cultivated soils. The study also aims to determine the genesis of volcanic formations which will help to find solutions to natural risks related to the volcanic activity in the region.

Doctoral student Kuepono Gilbert has also written requesting materials as he will also choose his doctorate subject in the field of Agrogeology. Both students have been sent ***RE*** materials to assist with their research.

## The Sahara Remineralizes the Amazon

The rich abundance of life in the Amazon has recently been linked to the windblown, nutrient-rich dust of the Sahara desert. Scientists, weather satellites, and NASA research have discovered enormous quantities of desert dust blowing across the Atlantic ocean and depositing itself on the Amazon rainforests. Researchers are just now presenting possible revolutionary ties between these two ecosystems.

Amazon soil is very thin and deficient in many nutrients, including phosphates needed for plant growth. The northeast trade winds, however, bring in 12.6 million tons of dust from the Africa Sahara and spread about a pound of phosphate per acre on the Amazon's floor. Scientists speculate that the Amazon rain forests, the most biologically diverse ecosystems on the planet, would be reduced to grassland without the fallout of dust exported from the Sahara desert.

## Indigenous Tree Conservation

Mr. Wonder Machimiri, a self-taught nursery-man in Zimbabwe, is currently seeking funding for research involving climate conditions, temperature, and rainfall patterns of indigenous trees. Mr. Machimiri needs financial support in establishing a forest nursery to broaden his research and share his knowledge. Mr. Machimiri joined the fight against deforestation and land degradation after noticing alarming environmental degradation in Zimbabwe. He propagates indigenous and exotic tree seed-

# The Ultimate Recycle Vision...

*by Bonnie Barclay*

When I was younger, my father always told me that the greatest problem facing the world was apathy. The more years I live, the more I realize how right he was. Just when all hope is lost though, I hear or read about an individual who really strives to make a difference: Richard Bennett is such an individual.

His mission: to take the idea of community and put it to work. He wants to start a "Recycle Radio" Series access show, where people can network about recycling and composting with rock dust. Earthseason (the managing organization), their schools and the Green Radio Ecology Education News Service (GREEN), are the main elements. Recycle Radio will focus on the theme of Applied Source Point Recycling, which will be the link for a large community "integrated waste management program."

Individuals and families can buy 'Shares Of The Harvest,' which will be a community investment for access to local organically grown vegetables, similar to CSA's, Community Supported Agriculture. CSA's are currently flourishing in many communities. It will also help to provide labor for organic farmers, urban permaculturists, and soil conservationists, an investment for all.

Earthseason School will direct the curriculum, using radio conference calls to organize the collection and distribution of food from homes, restaurants and cafeterias. Earthworms and rock dust will be added to neighborhood compost piles to speed the decomposition process.

A self reliant community is created with businesses working with people, and people working with each other, creating an effective, dynamic community.

On the radio show they will also talk to policy makers and city planners, facilitating an energy loop within the entire community. Give as much as you take, Earth's motto. Richard Bennett wants to turn this whole operation into an every day community service.

Recycle Radio will be an innovative news broadcast: information about recycling, composting, the restaurants that are in the energy loop, and also where people can call and ask questions and comment on the subject of recycling and daily life. Easy access will allow even those who think they are too busy to recycle, compost or keep in touch with their neighborhood to join in.

Help, money and resources are needed. This is a good opportunity for any motivated individual that gets excited about soil and it's fertility.

Nothing would be more awe-inspiring than to go into a city, discouraged by the crowds, noise and dirt on the ground, only to look up and see roof-tops covered in organic vegetable gardens, created from the waste of a restaurant down below. For more information, contact: Richard Bennett, P.O. Box 623, Nelson, BC, Canada,V1L 5R4.

lings using seeds, cuttings and open cast. His projects and publications have been featured in local press, radio, television and several international forestry magazines. The Ministry of Environment and Tourism of Zimbabwe and Mr. Machimiri would be grateful for assistance for further conservation research. Contact: The Secretary for Environment and Tourism, Private Bldg. 7753, Causeway, Zimbabwe.

## SR at the Natural Orchard Research Area

Located just over a mile south of Paw Paw, IL, the N.O.R.A. facility is approximately 5 acres devoted to an ecologically sound yet practical approach to growing food crops naturally. Natural orcharding at N.O.R.A. uses no artificial/chemical fertilizers, pesticides, plowing, tillage or cultivation, or any complex technologies. The guiding principals of the research area hold: human health is dependent upon plant health, a biologically diverse enterprise is the healthiest and most resilient, and pest and disease resistance is obtained through basic plant health. Soil enrichment is achieved through mulching, composting, and rock dust. The use of foliar feeding coupled with microbial innoculation is used along with cycling and recycling of all natural materials on site. (See Network List)

## *RE* Listed in USDA Publication

The Alternative Farming Systems Information Center has listed ***RE*** in its publication entitled, Sustainable Agriculture in Print: Current Periodicals (SRB 95-08). The AFSIC provides in-depth coverage of specific subject areas related to alternative and sustainable agriculture systems, including new industrial, and alternative crops. This AFSIC publication is a directory serving as a guide to the journals, magazines, newsletters, and other serial publications that provide information on topics relevant to agricultural sustainability. The catalog is published by the U.S. Department of Agriculture and is available from the National Agricultural Library, Beltsville, MD 20705.

## Surfing the Net

Where can you find information on the Internet about SR?

*The Book of Visions, An Encyclopaedia of Social Innovations, Over 500 of the best ideas from around the world* is edited by Nicholas Albery. Albery defines social innovation or social invention as "a new and imaginative way of tackling social problems or improving the quality of life." The Institute for Social Inventions, the organization which collected these visions, ideas and projects, was launched in 1985.

This extraordinary book can be found on-line and *Saving the planet with gravel dust* can be found under Environment and Ecology (Chapter 13). This is probably the most thorough networking of SR on-

line to date, with one page of information and a page of resources.

Unfortunately, the resource section is a little out of date, but will hopefully be updated in the coming year along with an update of more recent events. If you surf the net, I suggest looking it up and you can rate how you like the idea of remineralization, from bad to great on a scale of 0-10. Positive ratings will certainly encourage the Institute to keep information online and to update it when possible.

The book can be ordered by credit card and the price is £20.65 including postage. The Institute for Social Inventions, 20 Heber Road, London NW2 6AA, UK. Tel: 011 44 181 208 2853; Fax: 011 44 181 452 6434 E-mail: rhino@dial.pipex.com. (Nicholas Albery). Web site: http://newciv.org/worldtrans/BOV/BOV/BV-307.HTML.

Another Internet site of interest is Gaia Forest Archives at URL= http//gaia1.ies.wisc.ed/research/pngfores/ and networked by Ecological Enterprises. It comes from *Regenerating Dying Forests* by David Yarrow and includes an interview of Robert Bruck from Issue 3-4 of ***RE,*** *Regenerating Appalachian Forests, EarthDance Brings New Life to North Carolina's Dying Boreal Forests.* Please contact us with other SR Internet sites.

## *RE* Articles in Other Publications

An article by ***RE's*** Joanna Campe was printed in the professional berry growing newsletter, *Northland Berry News*, Vol. 9, No. 4, December, 1995. Campe's article focused on the work of Fritz Leipold, a German teacher and advisor for vegetables, fruit and horticulture in northern Germany from 1948 to 1980. The article mentioned Leipold's multi-annual mowing method for growing strawberries using rock dust to produce firm, ripe, and fungus-free fruits. Leipold had alleviated botrytis problems by using this mowing method. (See Agricultural Research packet). Campe expressed her interest in rock dust as a deterrent to botrytis and noted that she would appreciate results from readers of the *Northland Berry News* who gave rock dust a trial. Publisher/Editor is Paul Otten. Yr/sub rates: $15 domestic, $18 Canada, $25 foreign. *Northland Berry News*, 2124 University Ave West, St. Paul, MN 55114-1838; tel: 612-659-2418 fax: 612-659-2464.

Another great newsletter which ***RE*** highly recommends is *Worm Digest, Worms Deepening Our Connection to Food and Soil. Worm Digest* has information about the role of vermiculture in building healthy soils. There is information on products, and even a great kid's section in the recent issue. Editor Stephen White recently wrote an article on SR. Subscription rates are for 4 issues: $12 U.S., $16 Canada, $20 foreign. Edible City Resource Center, *Worm Digest,* P.O. Box 544, Eugene, OR 97440-0544.

Other notable articles recently in print: In **American Environmental Laboratory** (4/96), *Revisiting soil remineralization: More evidence that environment is more important than event* by Frederick I. Scott, Jr.; **San Francisco Chronicle**, *Powder Your Soil, Rock dust can boost fertility, by Julie Bawden Davis* (3/6/96) featuring Bob Cannard, Don Weaver and Henry Bruski of Spiral Stonemeal; **Martha Stewart Living,** *Cultivating, Using Rock Powders* by Ingrid Abramovitch and featuring Judy Roylance of Roylance Environments (Special Issue 3/96); and **Body, Mind, Spirit,** *Dance of the Electrolytes, Trace Minerals and Your Health* by Susan Kuchinskas (3/96), featuring the mineral health supplement Tracelyte™ of Naturopathic Research Laboratories.

## Wanted: For Marketing Rock Dust

Bob Musack of C &M Labs is looking for a person interested in marketing and distributing rock dust for agriculture. C & M Labs is the producer of NuLife and other liquid health mineral supplements produced in Utah. They are producing a consistent amount of rock dust monthly that is ideal for the agriculture market. Contact Bob Musack, CEO and President, C&M Labs, 807 Kincaid Road, Williams, OR 97544. 1-800-333-1160. Fax: 541-846-8961. Let him know you found out through ***RE.*** Also see listing of Nulife under Mineral Health Supplements on page 53.

## Networking SR Sources

Steven J. Blue, a physiologist living on the Hawaiian island of Mau'i is starting a Personal and Planetary Health Information Service, through which he intends to disseminate SR information and sources of rock dust to those who are interested. Steven J. Blue, P.O. Box 3091, Wailuku Town, HI 96793-3091, Tel. and Fax: (808) 249-0601, e-mail: jblue@aloha.net

## Translating SR Literature into Spanish

***RE*** member/subscriber Renate Hageman recently surveyed translated SR materials in Spanish and contacted Mauricio Waroquiers in Uruguay. Papers available from him in Spanish are *La Era Glacial y La Remineralizacion del Suelo* through the Centro Macrobiotico de Maldonado.

He is currently working on a translation of Larry Ephron's book *The End* and it is almost completed. He is looking for funds for a printing and can be contacted at Publicaciones GEA, C.C. 522080 – (20,000) Maldonado, Uruguay. Tel: 042-32334 and fax: 042-33942.

## German Publisher Looks for English Publisher

Deukalion, the publisher of books by many English speaking ecological authors translated into German has brought out a new German edition of *The Book of Rock Dust* by Snoek/Wulfrath. They found the topic important enough to be revised and republished. They are looking for a publishing company (or several) which could be interested in publishing a translation of the book in English. Contact: Uvve Hills, Deukalion Verlag, Postfach 11 13, Uetersener Strasse 12, D – 25488 Holm/Holstein, Germany. Tel: (0 41 03) 9 75 45 and Fax: (0 41 03) 9 75 07.

*First International Project to Utilize SR for Sequestering Carbon*

*Part of the U.S. Initiative on Joint Implementation, The President's Climate Change Action Plan*

# THE KLINKI FORESTRY PROJECT FOR COSTA RICA

***by Joanna Campe and Dr. Herster Barres***

The Klinki Forestry Project for Costa Rica is one out of fifteen selected for sponsorship by the U.S. Initiative on Joint Implementation. Launched in October 1993 as part of President Clinton's Climate Change Action Plan, USIJI was created to explore joint implementation between countries on projects that reduce, avoid or sequester greenhouse gas emissions. Among USIJI objectives are the fostering of private investment in innovative research and development on greenhouse gas reducing technologies.

***The project's Klinki research plantations will be interplanted with broadleaf deciduous trees and remineralized with regional sources of rock dust. An expected increase in timber volume due to soil remineralization will contribute greatly to the ecological and financial success of the project.***

Participants were invited to a ceremony at the Old Executive Office Building (part of the White House) in Washington, D.C. where they received an official USIJI certificate of participation. Joanna Campe of ***Remineralize the Earth*** was honored with an invitation to attend the ceremony by Dr. Herster Barres, Director of the Project. She accompanied the group that flew down from Connecticut to attend the ceremony on December 19, 1995. Members of the group included Dr. Herster Barres and Miranda Barres, donor, Joan McLaughlin, Office Manager of the Klinki Forestry Project for Costa Rica and of Reforest the Tropics, Inc., and Dorothy Hoyt, Teacher and facilitator of Fitch Middle School in Groton, CT.

On arrival in Washington, D.C. they were joined by a participating group from Costa Rica made up of Ing. Luis Cedeño, Board of Directors of the Cantonal Agricultural Center of Turrialba, representing the local Banks, Ing. Oscar Chaverría, also from the Board of Directors, representing the Institute for Agricultural Development and Ing. Carlos Cruz, Technical Director of the Center.

The ceremony was attended by the Ambassador of Costa Rica along with many U.S. officials. Vice President Gore was invited but not able to attend as a result of the crisis produced by the economic shutdown of the government. Hazel Leary, heading Energy, also was not able to attend as planned.

The Klinki Forestry Project for Costa Rica (Klinkifix) has been approved by the U.S. Initiative on Joint Implementation for the planting of 15,000 acres of fast-growing tree plantings on Costa Rican farms during the next six years. Klinki plantings have the goal of reducing the effects of global warming through carbon sequestering while promoting tropical reforestation. The project is an attempt to prepare the world for massive reforestation in the tropics should threats and consequences of global warming prove real. With the use of carbon sequestering, reforestation will absorb carbon dioxide, extracting it from the atmosphere through photosynthesis, and reduce thus the heat's reflection of heat back to earth.

The demonstration project is expected to sequester 1,200 metric tons of carbon dioxide per hectare over 40 years on 6,000 hectares – a total of two million metric tons over the project's duration.

The Klinki is a rare, tropical tree found in the remote mountains of Papua, New Guinea. Over 30 years of trials in Costa Rica illustrate the trees' excellent growth and carbon sequestration abilities. The project's Klinki plantations will be interplanted with broadleaf deciduous trees and experimentally remineralized with regional sources of rock dust. An expected increase in timber volume due to soil remineralization will contribute greatly to the ecological and financial success of the project.

In addition to reducing atmospheric carbon, the project promotes the development of carbon sequestration as a productive business solution to $CO_2$ emissions. Planting of fast-growing tropical trees, such as the Klinki, may offer U.S. companies a way to reduce net carbon emissions while promoting the reforestation of tropical pasture. Success in Costa Rica is expected to lead to larger plantings in other tropical countries. The Klinki augments the long-term carbon sequestering ability of the plantings while other species increase biodiversity, early production and farmer income.

Main participants of this USIJI sponsored project include Reforest

the Tropics, Inc., a Connecticut nonprofit company specializing in forestry and agricultural development and The Cantonal Agricultural Center of Turrialba, a nonprofit organization dedicated to developing regionally beneficial crops in Costa Rica.

In the United States, the cooperators are the Yale School of Forestry and Environmental Studies, the Forest Products laboratory of the USDA and three elementary schools in Connecticut. The cooperators in Costa Rica include the Cantonal Agricultural Centers, CATIE, EARTH, the Forest Service, farmers, and three elementary schools in Turrialba.

## Education

One aspect of the project includes pilot projects in three U.S. (Connecticut) and three Costa Rican schools (Turrialba, Costa Rica) to create an awareness of the role of carbon in our society, its benefits and limitations with special reference to global warming, its causes and economically feasible solutions. It will educate students in the concept of a "Carbon Balanced Community" in which we attempt to balance our carbon emissions with the amount the Earth can absorb. Creating larger carbon sinks through tree planting contributes to this balance.

## Klinki – An Ancient Species

A tropical conifer, Klinki (*Araucaria hunsteinii*), is a prehistoric tree genus 140 million years old; dinosaurs and Klinki forests may have been once contemporary as shown by fossil discoveries.

Klinki fiber is very long and the wood is strong and light. Farm products would be export-grade industrial wood for plywood, paper, lumber and utility poles.

Five million nursery plants are needed during the project. The sources of seed are Papua New Guinea and local production in Costa Rica, augmented with vegetative reproduction of Klinki.

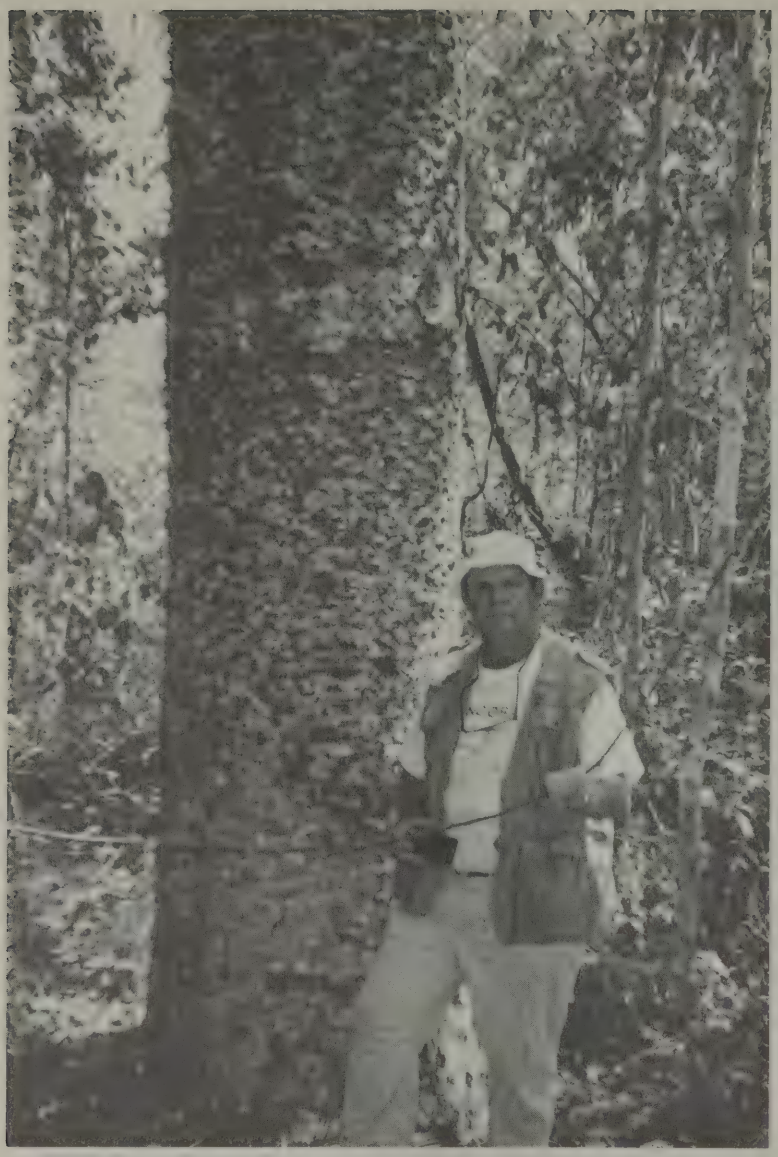
*Dr. Herster Barres in a 17,000 hectare stand of Klinki.*

## Biodiversity

The project will increase biodiversity by adding other species of trees and their ecosystems in mixed plantings. Plantings are to be done on degraded pastures, returning those areas to forest cover. The project is designed to convince the farmer, often responsible for the destruction of the natural forest, that productive, forested areas on his farm can be profitable if used for wood production and carbon sequestration for a fee.

## New Technologies

New technologies include the Klinki Matrix System, various tree species in a matrix of Klinki, specifically designed to maintain biodiversity, produce early yields, efficient sequestration and long-term storage of vegetative carbon. Carbon accounting or inventories will be a basis for carbon payments to farmers. Linkage of U.S. utilities or corporations (emitters) to farmers (sequesterers) by pilot farmer and industry carbon contracts, would allow U.S.



*Dr. Herster Barres next to a Klinki in a forest in Papua, New Guinea*

emitters to field test paid sequestration at a relatively small annual cost.

## The Carbon Market

A market for sequestered carbon doesn't yet exist, but as society recognizes the causes of global warming and as its effects become more evident, political consequences will arise. Stephen R. Connors, Director of the Electric Utility Program at Massachusetts Institute of Technology, said "There's a high possibility that C02 emissions will be regulated sometime around the year 2000. We have no idea how those regulations will look. They may be negligible and they may be serious, but managers are beginning to ask how they can prepare for them."

## Possible Farm Scenarios

In Costa Rica farmers would begin to plant carbon sequestering plantings for wood and potential carbon revenues initially using their own capital. A recent survey found 40 farmers interested in the project and willing to plant 6000 acres. Here are just a few of many possible economic scenarios suggested by Dr. Barres:

1) The Costa Rican government would receive soft loans from carbon taxes in Europe to finance farmer carbon plantings. Credits for farmer-sequestered carbon would be sold through a government board to the highest bidder with the farmer receiving annual payments for the carbon sequestered.

2) A U.S. utility company finances the farmer planting at $1,000/hectare. The utility owns the carbon credits for 40 years, the farmer manages the planting and owns the wood.

3) A consortium of U.S. companies with U.S. and C.R. partners establish a Costa Rican joint venture to manage the financing and contracting with farmers to sequester carbon and produce wood and wood products.

If global warming does not continue and/or payments for carbon sequestration do not occur, farmers will be left with economic and beautiful tree plantations that will be ecologically sustainable and contribute to the rainforest cover in Costa Rica.

## End Result

Expansion of the plantings will take place in Costa Rica and abroad in areas with much larger carbon sequestration when the project has proven successful in developing the economic production and sale of sequestered carbon on farms in this demonstration project. Sequestered carbon could become a major crop for farms in tropical America, while providing raw material for wood industries and export products. The expansion of farm plantings could reduce the effects of slash and burn agriculture, and provide a financial basis for permanent and valid communities without degradation to tropical soils.

If the market value of sequestered carbon in trees has not been established by the end of the project, it will have at least established a carbon-content baseline for 15,000 acres with which to judge the effectiveness of carbon sequestration in the future.

## Funding

The Conference of Parties, established by the Framework Convention on Climate Change, determined that project financing for activities implemented jointly (under the auspices of the USIJI) may not come from official development assistance, but must come from private sources. The project is now seeking support. The project cost is $3.9 million in grant funding for developmental costs during the initial 6 years.

For further information and lecture services, contact Dr.Herster Barres, Project Director, P.O. Box 601, Mystic, CT 06355, tel: (860) 572-8199, fax: (860) 536-7739, email: hbarres@aol.com.

# *Remineralize the Earth* Receives a Grant for Research Project in Western Massachusetts

*by Jennifer LeJeune*

*Twenty tons of basalt rock dust (referred to locally as traprock) being stored for future incorporation in Smith Farm compost.*

Remineralize the Earth, Inc. will be bringing soil remineralization (SR) to several of Western Massachusett's commercial growers with an aim at making farming more environmentally sound and profitable in Massachusetts. The study, entitled *Soil Remineralization for an Economically and Ecologically Sustainable Agriculture in the Pioneer Valley*, will assess SR's economic and ecological impacts as a soil amendment, constituent of compost, an anti-fungal agent, and insect deterrent. The research is being funded by the Massachusetts Society for Promoting Agriculture, the National Aggregate Association (NAA), the National Stone Association (NSA), and the Center for Aggregate Research/Aggregate Foundation for Technology, Education and Outreach (CAR/AFTRE).

SR trials will be carried out over two years and will test local sources of rock dust on vegetable and fruit crops, including those of particular commercial importance to the Pioneer Valley. The growth trials will be conducted at Smith Vocational and Agricultural High School and on the farms of four local growers.

Joanna Campe is the Project Coordinator and Professor Allen Barker, Ph.D. of the University of Massachusetts Plant and Soil Science Department will conduct and evaluate the trials as the study's researcher. Tara O'Brien, a Ph.D. candidate under Dr. Barker, will also work on the project.

Along with collecting scientific data, the trials will help familiarize farmers with SR and spread its commercial use. Remineralize the Earth Inc. will create a newsletter and handbook for farmers, promote SR through press releases and magazine articles, as part of an educational and outreach program.

## Research Goals

With a goal of improving the quality and profitability of farming practices, the research will be used to spread the knowledge on soil remineralization. The study will demonstrate that remineralizing with rock dust can reduce the amount of chemical inputs needed, lending both profitability and sustainability to agriculture.

## SR and Compost

Smith Vocational and Agricultural High School, located in Northampton, MA, is a valuable education resource where students learn innovative, productive and sustainable agriculture. The school's farm has a thriving Community Supported Agriculture Project and an award-winning composting system that includes a bulking-agent, multi-species manure, and supermarket and restaurant food wastes in a retail composting operation.

Smith Farm will add rock dust to their compost, a process that gives rock dust's decomposition a head-start in releasing the nutrients beneficial to microorganisms and plant nutrition. After the growing season, researchers will evaluate how well the composts fared, with and without rock dust, by comparing the fertility of soils, growth yields, mineral composition, and appearance and flavor of the fruit and vegetable crops.

Fine basalt rock dust from a quarry in Amherst, Massachusetts, will be added to the study's compost mixture at 50 lb per cubic yard of raw material. At maturity, the compost should have about 100 lbs of rock dust per 1000 lbs of compost, or about one ton of rock dust per acre.

## Commercial Farm Trials

The four participating commercial farms in the Pioneer Valley region have agreed to test rock dust on the fields where the trial crops willl be grown in hopes of seeing an improvement in soil and plant health. Depending on the crop, each grower will apply basalt rock dust and/or glacial rock fines to the soil and some will use foliar applications. Crops being considered for testing are apples, strawberries, leeks, organic potatoes, and sweet corn.

Smaller grants may be requested to assess chemical and pesticide residues in the soil of growers and to determine if SR is speeding up the bioremediation of the soil by removing pesticides' heavy metals and inorganic compounds. Positive results from such research would present the possibility of a shorter transition process involved in becoming organic and encourage farmers to shift to sustainable practices.

# Can Remineralization Save the Tropical Rainforest?

## A Two-Year Study

*by Sarah Bruck*

*Sarah Bruck, 17, lives in Cary, N.C. Her father is a professor at N.C. State University and works on soil remineralization's effects on trees. Upon her father's return from researching in Central America, Sarah decided to set up an experiment based on the question "what would the effects of soil remineralization be on the endangered Mahogany trees of the neotropics?" For her project she spent many evenings and weekends at the N.C. State greenhouses, and it was worth it. Sarah found that by remineralizing depleted soil types of the tropics, a growth response is realized. She entered her project in the N.C. State Science Fair and was awarded special plaques from the North Carolina Wildlife Commission and the National Wildlife Federation.*

### Problem

Will rock dust from five different quarries improve the growth and vigor of Mahogany seedlings over a two-year period from a mountain rainforest in Costa Rica?

### Hypothesis

Minerals from the rock dust will continue to improve the growth of Mahogany seedlings grown in a greenhouse.

### Background

#### *Soil Remineralization And Rock Dust*

The soils of the entire world have become severely demineralized by erosion over thousands of years. Just as we do, plants require a continuous intake of minerals, including calcium to build structural support, and iron to carry oxygen. Plants growing on mineral-depleted soil do not get enough nourishment and consequently are smaller, less abundant, and more vulnerable to insects, worms and fungi.

Remineralization causes a phenomenal growth of the microorganisms in the soil. It increases the nutrient intake of plants, counters the effects of soil acidity, prevents soil erosion (for that reason alone it would be worth applying rock dust), increases storage capacity of the soil, contributes to the building of precious humus complexes, has antifungal properties, and repels insects when sprayed on plants. The resulting plants and seedlings become highly resistant to insects, disease, frosts, and drought.

The problem of soil demineralization has a global perspective. The Earth's soil becomes demineralized during each interglacial period, the relatively short 10,000-year warm period between each 90,000-year major Ice Age. Consequently, there is a decline and death of much of the world's forests and vegetation, causing great quantities of carbon-dioxide to be given off. The level of carbon-dioxide and other greenhouse gases trap excess heat from the sun, potentially affecting the world's climate.

Feeding poor soil with mixed rock dust may be compared to feeding an ill person a varied diet of unrefined, natural food. If no one single food is a panacea, it might follow that no single rock type is "ideal."

Indeed, the virtue of glacial gravel is said to lie in its broad spectrum of rock types. Scientists advocate the use of glacial gravel dust, ideally followed by river and seashore gravel and mixtures of single rock types.

Research in several countries shows that finely ground, mixed rock dust restores the original fertility of agricultural soils, comparable to natural processes of soil building such as the weathering of mountains and glaciation. Plants grown on such remineralized soil grow up to 200-300% faster, producing similar astonishing increases in yield.

## *Why Rock Dust?*

Demineralization occurs when soil minerals, ground from rocks by the last glaciation, are so depleted they can't support plant life. Exhaustion of soil minerals initiates the chain of events which results in restocking soil with minerals and a new proliferation of life. Plants get cell protoplasm from soil microorganisms (which produce protoplasm by taking elements from stones in soil, and combining them with carbon in plant or soil organism residue to make organic compounds).

When elements are no longer available in soil (the case at present), microorganisms die of famine, and plant life also starves to death for lack of protoplasm. Forests, jungles, and other plant life are destroyed by disease, insects, drought and fire. Ultimately, most carbon in plants winds up as $CO_2$ in the atmosphere.

## *Mahogany Seedlings*

There are many different types of mahogany. The true mahogany, *Swietenia mahogani,* is the one I am using in my experiment. This species is a native of tropical America, occasional small specimens being found in extreme southern Florida. It was formerly abundant in the West Indies, attaining heights of 150 feet or more in Jamaica, but on account of the demand, it is now scarce. Cuba and Hispaniola formerly supplied the choicest, and Honduras the low grades. Now, practically all specimens come from Central America. The wood is generally some shade of brown, fine grained, easily polished, and durable except under lateral strain. It is highly valued for furniture, musical instruments, interior house finishing, and the like, and is one of the most popular woods of the world. Formerly it was used for shipbuilding but now very little. The tree, which sometimes attains heights exceeding 100 feet, and diameters of six feet, has abruptly pinnate leaves with usually four pairs of leaflets and small white or yellowish flowers in axillary or nearly terminal panicles. As an ornamental tree it is planted in southern Florida and southern California in rich soil.

## *Tropical Rain Forests*

The rain forests of the lowlands of the equatorial region constitute the most luxuriant vegetative type known. They are made up of many broad-leaved evergreen seedlings and occur in regions where the annual rainfall is 80 inches or more and where there is no distinct or prolonged dry season. The forests termed equatorial are found within a belt some six or seven degrees wide on either side of the equator. Strict limits cannot be assigned to this region, but it is limited by the occurrence of the conditions most favorable to the development of woody forms. In most such regions, the forest originally extended from sea level up to the tops of the mountains. The characteristic inland forest of the lowlands extends from about sea level up to the beginning of the hill forest, which may be at about 2,000 feet, though it may be higher or lower. The forest canopy is almost complete and has an average height of 150 feet or more, with occasional seedlings projecting above it.

Many of the world's remaining tropical rain forests are under a virtual death sentence. One-fifth of the 12.5 billion acres of forest that once blanketed earth are already gone. Each second, more than an acre of tropical forest disappears. Scientific theory suggests that at this rate of forest loss, one species of plant or animal dies out every 15 minutes. If current deforestation rates continue, most accessible tropical forests and up to one-quarter of the Earth's species could vanish within the lifetime of today's children.

In the past, though, forests recovery odds were better than they are now because the human population was relatively small, technologies for forest clearing were unsophisticated, and the forests under siege were mostly in temperate zones, not the tropics. Relatively speaking, temperate forests are hardy and resilient, and will spring back if they are left alone, largely because up to 97% of the nutrients required for new forest growth are stored in the soils. In contrast, tropical forests store up to 90% of their vital nutrients in the vegetation that is removed in whole or part during deforestation.

Once the rainforest has gone, the soil deteriorates, usually leading to the abandonment of the land within a few years. The standard explanation for this is that the soil is lacking in mineral nutrients needed for plant growth principally nitrogen, phosphorus, potassium, calcium and magnesium. According to this view, the vegetation and plant life in this ecosystem are adapted to scavenge any nutrients in the fallen leaves and other forest litter. Nutrients are quickly sucked back into the living components of the ecosystem, and few are left in the soil to be washed away by rain.

The underlying problem in the Amazon Basin is that the soil and subsoil are naturally infertile and have been further drained of nutrients by the incessant rain that has fallen over many millions of years. In temperate forests, nutrients are leached away, but the weathering of the subsoil, which produces fresh soil, makes good the loss. In the Amazon Basin, the subsoil itself is already impoverished. To make matters worse, the Amazonian soils are lacking in substances which can hold nutrients in. This is particularly true of the sandy soils, and any nutrients washed into the soil from the leaf litter are quickly leached away. The trees are adapted to cope

with this situation by having a spongy mat of tangled rootlets on top of the soil to intercept nutrients before they are washed away. The roots are coated with fungi, which attach themselves to decomposing leaves, channelling nutrients such as phosphorus directly back to the root.

The recycling of nutrients through the breakdown of dead animals and plants in all ecosystems is essential, but particularly so in the rainforest where low soil fertility often leaves little to spare. The organisms that act as decomposers are known as "saprotrophs" which literally means "putrid nourishment." They have become adapted to feed on dead materials. By feeding on these substances, they also break them down.

On a world scale, all tropical rain forest soils are somewhat infertile, due to the perennial leaching by rainfall. The trees also have to contend with the effect of rainfall on their leaves, washing out nutrients such as potassium which must then be recouped from the soil by the roots.

Todays people recognize the urgency of development and the need to use nature's renewable resource system, tropical rainforests, to satisfy human requirements and eliminate the appalling poverty that affects so many people today. But such development must be sustainable, using the income from nature without eroding its capital of soil, water and fertility.

To many tropical countries, forests are an important constituent of national wealth. They protect soil fertility, regulate and purify water flow, and yield valuable timber and other products; used sustainably they are an economic and environmental asset for tomorrow as well as today. Used destructively, for short-term gain, they are all too likely to be replaced by degraded land and impoverished people. In much of the forested region, a balance between protection and skillful sustainable use is needed.

If this balance is to be achieved, the industrialized countries that buy tropical forest products must support and cooperate with producer countries. The attention paid to rain forests by the world's media is an encouraging sign of the growing general concern for environmental conservation. But some campaigns have failed to see the issues from the point of view of the people who inhabit the developing countries of the tropics. Saving rain forests requires a full understanding of their complex ecology, but depends even more on finding solutions to human social problems such as ridding poverty, easing debt, and above all, creating conditions under which human population growth will slow, and where people achieve an enduring harmony with nature.

## Materials

- 60 one year-old Mahogany seedlings grown from seed.
- Sterile potting medium consisting of 1/3 peat, 1/ 3 perlite, and 1/3 vermiculite.
- Fifty 50 gram pouches of rock dust quarried from Grove Stone, NC, Lake Norman NC, North Quarry, NC, Lilesville, NC, Colorado quarry, CO.

## Procedure

One-year old Mahogany seedlings were grown from seed from a source in Costa Rica and transplanted into two-liter plastic pots containing sterile potting media consisting of 1/ 3 peat, 1/3 perlite, and 1/3 vermiculite. Seedlings were maintained under greenhouse conditions of daytime temperature 80° F and night time temperature of 65°F for one year. Fifty of the seedlings then received 50 grams of one of the five rock dust materials. At this time the height of each tree was measured and recorded. Seedlings were watered twice a week for three months and measured every other week for growth parameters. At the end of the first year experiment leaf tissues were measured for nutrient content by atomic absorption spectrophotometry, by the NCDA in Raleigh. Eleven months later the Mahogany seedlings received another 50 grams of the same rock dust material. Seedlings were then watered twice a week and measured for height growth once a month.

## Results

### *Growth*

Over a period of eight weeks I measured the growth of sixty Mahogany seedlings treated with rock dust from five different quarries. On November 14, 1992 the average height of the seedlings receiving Planters II was 37 cm. On December 6, 1992, the Planters II seedlings had an average of 52 cm. For the next month they had a steady growth of 5 cm every two weeks. On January 9, 1993 the seedlings re-

ceiving Planters II had an average height of 69 cm.

On November 14, 1992 the seedlings receiving rock dust from the Lake Norman Quarry had an average height of 44 cm. For the next month and a half they had a steady growth of 2 cm every two weeks. On January 9, 1993 the seedlings receiving rock dust from the Lake Norman Quarry had an average height of 57 cm.

The ten seedlings receiving rock dust from the North Quarry on November 14, 1992 had an average height of 43 cm. Over the next month they had a steady growth of 1 cm every two weeks. On December 27, 1992 they had an average height of 49 cm. On January 9, 1993 the seedlings receiving rock dust from North Quarry had an average height of 51 cm.

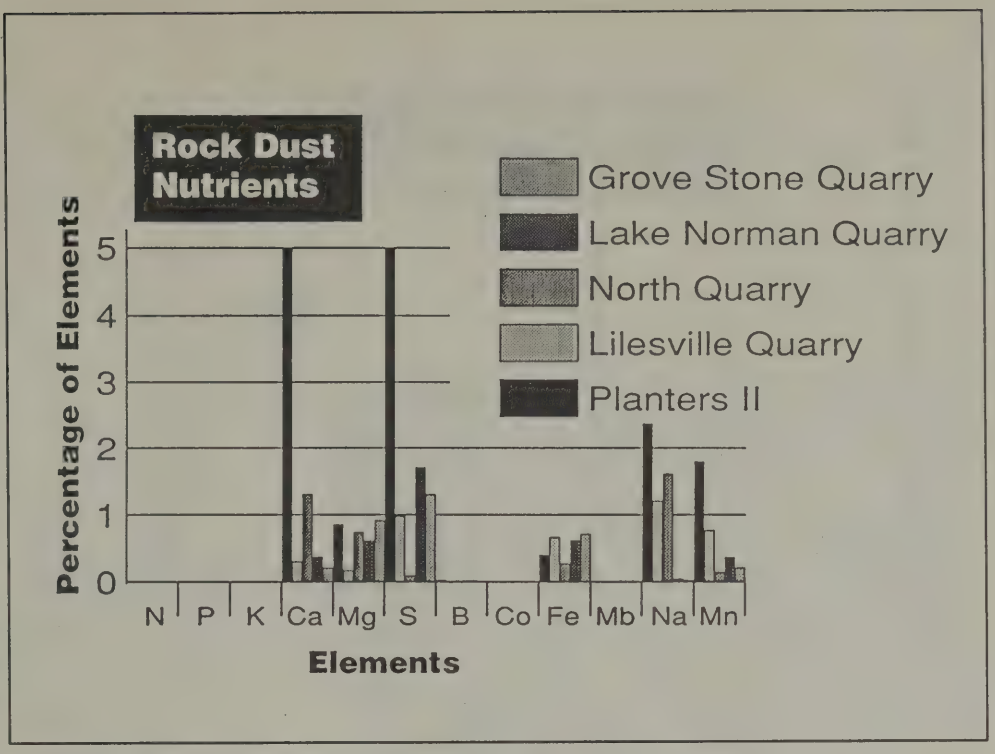
On November 14, 1992, the ten seedlings receiving rock dust from the Lilesville Quarry had an average height of 38 cm. On December 6, 1992 these seedlings had an average height of 43 cm. For the next month the seedlings grew at a steady rate of 2 cm every two weeks. On January 9, 1993 the seedlings receiving rock dust from the Lilesville Quarry had an average height of 51 cm.

The ten seedlings receiving rock dust from the Grove Stone Quarry on November 14, 1992 had an average height of 37 cm. Over the next two months these seedlings grew at a steady rate of 2 cm every two weeks. On January 9, 1993 the seedlings receiving rock dust from the Grove Stone Quarry had an average height of 48 cm.

On November 14, 1992 the control group receiving no rock dust had an average height of 41 cm. Over the next two months these seedlings grew at a steady rate of 1 cm every two weeks. On January 9, 1993 the control group had an average height of 45 cm.

## Nutrients

At the end of the treatment period I removed three leaves at random from each treatment. These leaves were air dried and sent to NCDA Tissue Analysis Laboratory on Blue Ridge Road in Raleigh, NC. One month later a computer printout of the results listing the concentration of the following elements was received [phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), manganese (Mn), sodium (Na)].




Planters II had concentrations of the elements as follows: phosphorus .67%; potassium .89%; calcium .51%; magnesium .42%; and manganese .08%.

Lilesville Quarry had concentrations of the elements as follows: phosphorus .58%; potassium .50%; calcium .32%; magnesium .20%; manganese .03%.; and sodium .03%

North Quality had concentrations of the elements as follows: phosphorus .42%; potassium .61%; calcium .33%; magnesium .19%; manganese .03%; and sodium .03%

Lake Norman Quarry had concentrations of the elements as follows: phosphorus .45%; potassium .53%; calcium .29%; magnesium .23%; manganese .04%; and sodium .032%.

Grove Stone Quarry had concentrations of the elements as follows: phosphorus .41%; potassium .45%; calcium .33%; magnesium .22%; manganese .03%; and sodium .03%.

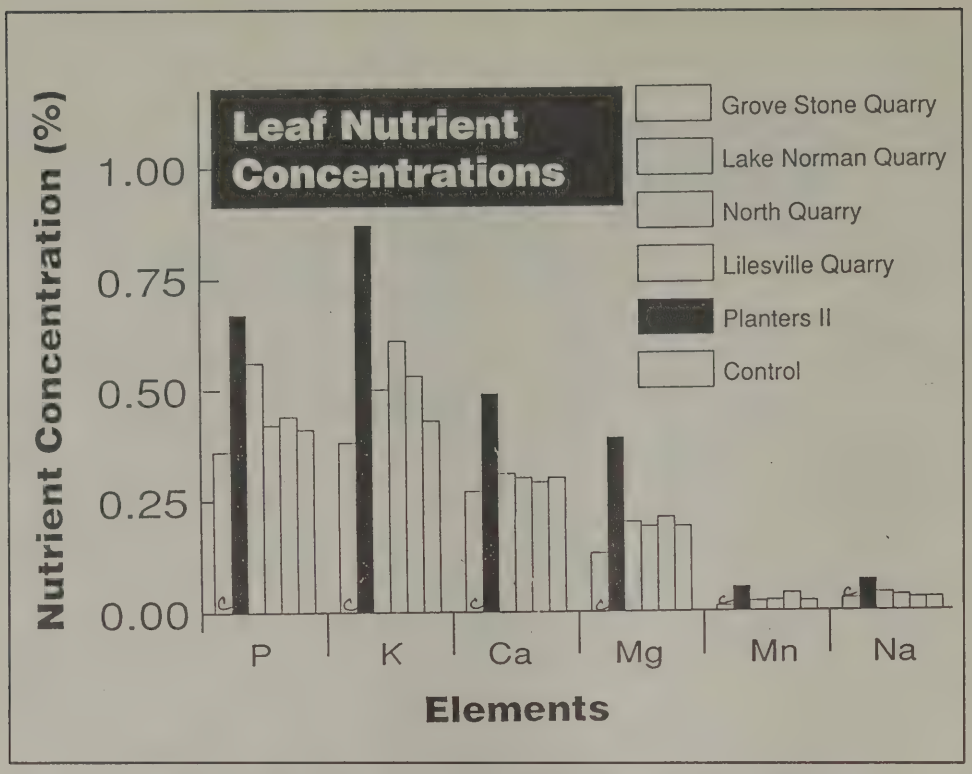
## Results 1994

On November 21, 1993 I started my second year of study. At this time the average height of the seedlings receiving Planters II was 76 cm. For the next 2 months they had a steady growth of 3 cm every 2 weeks, ending on the average height of 82 cm.

The ten seedlings receiving rock dust from Lake Norman Quarry had an average height of 62 cm on November 21, 1993. On December 29, 1993 they grew 1 cm each. On January 11, 1994 the seedlings receiving Lake Norman rock dust had an average height of 64 cm.

On November 21, 1993 the ten seedlings receiving rock from Lilesville Quarry had an average height of 59 cm. The seedlings then grew steadily by 1 cm each month. These seedlings from Lilesville Quarry on January 11, 1994 had a total height of 61 cm.

The ten seedlings receiving rock dust material from North Quarry, N.C. had an average height of 50 cm one year after treatment had begun on November 21, 1993. On December 29, 1993 these seedlings reached 54 cm. During the next month they had an average growth of one cm with a total height of 55 cm on January 11, 1994.




On November 21, 1993 the ten seedlings receiving rock dust from Grove Stone Quarry had an average height of 49 cm. The seedlings reached a height of 52 cm on December 29, 1993. On January 11 the trees receiving rock dust from Grove Stone Quarry had an average height of 53 cm.

The ten seedlings in the control group, receiving no rock dust material had an average height of 46 cm. on November 21, 1994. On December 29 the control seedlings stayed the same at 46 cm. During the next month they grew 1 cm to 47 cm on January 11, 1994.

PLANTERS II
TRACE MINERAL FERTILIZER
THE STANDARD FOR 45 YEARS
SMALL 5 LB. PACKAGES
MAY BE ORDERED DIRECTLY FROM U.S. SOIL
1-800-254-1306
DEALERS WANTED
U.S. SOIL INC.
P.O. BOX 926, SALIDA, COLORADO 81201

## Conclusion

My hypothesis has been confirmed. Rock dust from various sources stimulated the growth of Mahogany seedlings. However, a differential response was observed. Planters II, derived from a rock quarry in Colorado, induced the greatest growth of my experimental seedlings. Lake Norman Quarry showed the second most increased response in growth, then follows Lilesville Quarry, North Quarry, Grove Stone Quarry all found in North Carolina. The control group showed the least amount of growth.

This two-year study of Mahogany seedlings shows that rock dust not only speeds the growth and vigor for a short amount of time, but enables the seedlings continued rapid growth over an extended period. Not only do the seedlings grow faster, but the seedlings receiving rock dust are healthier and more resistant to disease.

There is a lot to learn about soil remineralization and rock dust. Remineralization causes a phenomenal growth of microorganisms in the soil and increases nutrient intake of plants. Remineralization builds resistance against many plant diseases. Many of the world's remaining tropical rainforests are under a virtual death sentence. Each second, more than an acre of tropical rainforest disappears.

The use of rock dust in the tropical rainforest would put nutrients back into the soil where the forest has been depleted. With more nutrients in the soil the rainforest would rebuild itself again.

## Acknowledgements

I would like to thank my father for allowing me to use his greenhouse during a year and a half. I would also like to thank the NCSU Department of Forestry for letting me have 60 Mahogany seedlings to use in my experiments. My mother has been a big help to me. She has worked with me for several nights helping design my backboard. I would also like to acknowledge my whole family for moral support.

## Bibliography

Collins, Mark. ed., 1990, The Last Rain Forests, Oxford University Press New York.

Dwyer, August 1990, Into The Amazon, Sierra Club Books, San Francisco, p. 1-4.

Miller, Kenton 1991 Seedlings of Life, Beacon Press, Boston, p.l-3.

"Amazon," Encyclopedia America Vol. #1, Americana Corporation, New York, p 466-470.

# New York Grape Grower Conducts Field Test On Glacial Rock Dust

*by Robert J. Able*

New York State's Lake Erie, Ontario, and five Finger Lakes provide some of the Eastern United State's best wine-growing habitat. The lakes act as a large heat sink in stabilizing ambient conditions conducive to grape growing. The lakes, in conjunction with sand and gravelly loam soils – the result of two glaciations, 10,000 and 20,000 years ago – provide a well drained soil. This soil is known by grape farmers, including those at A.T. Chiavetta & Sons, to promote excellent grape growing conditions.

A.T. Chiavetta & Sons, Inc. farms in Bryant, NY, just eight miles south of Lake Erie and is in its third grape growing generation. Chiavetta & Sons have grown Concord grapes here for many years and supply produce for the wine, juice and jelly industries.

Sam Chiavetta, a Cornell graduate in agriculture science, currently manages the farm. Mr. Chiavetta was recently intrigued by the remineralization concept and its applications in producing a healthier, less chemically dependent harvest. A portion of his vineyard was set aside this year (1995) to investigate remineralization's merits.

In July, several rows of wine grapes were selected for treatment with either eight or twenty tons per acre of glacial rock dust. The rock dust was obtained from the Springville, NY sand and gravel operations owned by Gernatt Gravel Productions, Inc., of Collins, NY. The glacial rock dust was essentially 87% minus #200 mesh with a known elemental analysis provided by the aggregate producer. Each application was superficial and not worked into the soil. Due to late season application, the acreage had been treated with the standard recommended chemicals and fertilizers.

Soil samples obtained from the vineyard were analyzed for pH, phosphorous, potassium, magnesium, calcium, copper, boron and zinc. From this information, recommendations were made for the 1996 fertilizer application. This years' crop had a Brix reading of 16.1 and yield of about five tons per acre. The local Cornell University Nutrient Laboratory Cooperative Extension Agent suggested that all comparative crop analysis wait until 1996 for the superficial rock dust application to start penetrating into the soil root system.

It is Mr. Chiavetta's intent to closely monitor the areas seeded with the glacial rock dust and perform extensive tests through the Nutrient Laboratory comparing treated with untreated areas. The long term intent is reduction and/or elimination in chemical use We hope to provide an update the results of this field investigation in 1996 and 1997.


**Glacial Dust in Upstate New York**

**Dan *Gernatt Gravel* Products, Inc**

**Robert Able, (Sales Manager) is Remineralization Committee Chairman for the National Aggregate Association**

**Collins, NY 14034 (716) 532-3371 Fax: Ext. 149**

**From Buffalo: 716-337-0223 Mobile: 716-861-7113**

# Winning International Awards with Remineralized Wines and Brut

At the age of forty-three, Stephen Cipes left a New York City suburb to move his family to the pristine region of Kelowna, British Columbia and transformed an old vineyard into the Summerhill Estate Winery.

He chose Kelowna, which has a 100-year -old flume system providing pure water, because it is an area with no industry and virtually no air pollution. Grapes are grown under ideal conditions in the Okanagan Valley. This is the northernmost viticulture region in the world, and with only 11 inches of rain a year, it is a semi-desert with little humidity and winter temperatures comparable to New England's.

***Yarrow Alpine recommended rock dust to Cipes as a means to replenish the leached soil. She stressed feeding soil rather than plants to make them resistant to disease through a nutrient-rich soil.***

Summerhill is known widely for it's production of the Cipes line of method Champenoise with Cipes Brut outselling all French Champagnes in British Columbia for two years in a row. His champagne, French Cipes Brute, outsold French champagnes in Canada in just three years. Cipes has won top international prizes for his wines and champagnes. Summerhill's 1993 Pinot Noir was served to her Royal Majesty, Queen Elizabeth II at a gala banquet when her Majesty opened the Commonwealth Games in Victoria this past summer. In the U.S., Summerhill wine is sold through direct mail ordering.

When the Cipes family moved to Kelowna in 1987, they were determined to remove pesticides from the grounds of the newly bought 60-acre vineyard. They were concerned with the toxic leaching of pesticide's harmful chemicals into Lake Okanagan as well as with the health of their four young sons. Using organic measures they brought about a swift conversion to strict organic growing practices. By replacing inorganic fertilizers with cow-manure and green manure, Cipes safeguarded his family, water supply, vineyard grounds, and subsequently his wine from dangerous chemicals and pesticides. Organic growing is easier in British Columbia because of low pests, no bugs and little funghi due to dryness. The only spray Cipes uses is Sulphur – which is organic. As a result the Winery was accepted into the organic certificate program administered by the Similkameen Okanagan Organic Producers Association.

Summerhill's winemaker, Dr. Alan C. Marks, has a substantial background and interest in organic growing and sustainable agriculture. With a Masters degree in Horticulture and

# at Summerhill EstateWinery in British Columbia

*by Joanna Campe*

a Ph.D. in Food Science from the University of Arkansas, Marks has investigated methods to reduce or eliminate sulfites by using ascorbic acid (Vitamin C). Sulfites are the chemicals known to cause the wine drinker's notorious "morning-after" headache, but are not found in Cipe's wine.

An area herbalist and ***RE*** subscriber, Yarrow Alpine, recommended rock dust to Cipes as a means to replenish the leached soil. She stressed feeding soil rather than plants to make them resistant to disease through a nutrient-rich soil. Cipes began using glacial dust, purchased from Michael Dean of Gaia Resources in Grand Forks, Canada. He gets Piedmont glacial moraine which is naturally crushed, not by machine.

Cipes applies the rock dust by mixing it with organic matter and applying it with a spreader and uses foliar sprays, also. He now applies one ton per acre each year and may start doubling this application. The dust derives from the Piedmont Glacial Moraine which shifted southward after the last ice age. Though he doesn't have enough empirical data to draw definitive conclusions on the rock dust's performance, Cipes confidently asserts that his top wines have all been made from grapes grown in rock-dusted soil.

# Long Term Reclamation Study: Hopkins County, Kentucky

*By Dr. Terry J. Logan, Professor of Soil Chemistry*
*Billie Harrison*
*Lori Goins*
*Ohio State University, Agronomy Department*

*Before*

*After*

## History of Site

The Faye Britt-White City Wildlife area had been mined for coal from the early 1900s to the 1960s. As the mining technology improved during this time, more invasive procedures were used to extract the ore; this left the area with very little vegetative growth and an acid pH of 2.5. After mining ceased on this site, it was essentially left unattended except for use as a water impoundment during some of that period. Previous to any treatment, observers compared the site to a moonscape.

In 1985, fifty tons of agricultural lime per acre was applied. However, the lime had no effect on plant establishment and soil sampling indicated that there was no change in soil pH (values ranged between 2.1 and 2.5).

In October of 1988, at the end of a drought, 100 tons per acre (wet weight basis) of N-VIRO Soil was applied. The N-VIRO Soil was obtained from Louisville MSD and was spread with a disk. The disk did not break the ground because the area was so dry and rocky. At the same time that the N-VIRO Soil was applied, the "normal-shock" reclamation treatment of 25 tons per acre of agricultural lime was applied to the rest of the site. Both treatments were then seeded with a mixture preferred by fish and wildlife conservationists which included orchard grass, blue grass, white sweet clover, sericea lespedesa, Korean lespedesa, switch grass, and blue stem. The plots were then mulched with wheat straw.

Three weeks after application, the grass in the N-VIRO Soil treated areas had germinated. By the following spring, the grass on the N-VIRO Soil areas was thick and tall, turkey and deer tracks were seen in the area and the bond was released. No weakened or stressed areas could be found within the N-VIRO Soil application areas while areas which had been treated with lime were still stressed by low pH and showed very little plant growth.

## Results of Soil and Plant Sampling

Samples of the soil and vegetation in both the N-VIRO Soil treated area and the conventionally limed area were taken in March of 1994, approximately five and one-half years after N-VIRO Soil application. On examination of the data, it looks like one of the replicates (A), labeled Ag Lime Treatment may have actually been the N-VIRO Soil area. There was some uncertainty about plot boundaries at the time of the sampling.

## Soil

Trace element concentrations were comparable for both the N-VIRO Soil and the lime treatments. Cadmium concentrations were the same (2.5 mg/kg) for each treatment. Copper values were very similar between treatments as well. Values ranged from a low of 98 to a high of 135 mg/kg. Nickel concentrations ranged from 20 to 36 mg/kg with no difference between treatments, with lead concentrations following a similar trend. Zinc levels were higher by about two times on the area that had been treated with N-VIRO Soil.

Average total calcium concentrations are 11.8 times greater on the N-VIRO Soil plots as compared to the lime treatment. Potassium and magnesium values are comparable between treatments.

The pH readings on the soil with the N-VIRO treatment range from 6.0 to 7.3. Individual readings on the replicates from the lime treatment were A -6.5, B -4.0, and C -4.3.

The higher pH reading of Ag Lime replicate A could reflect a sampling error (it was the replicate closest to its adjacent N-VIRO Soil area).

Electrical conductivity (EC) values (an indicator of soluble salt content) for both treatments are well below phytotoxic levels.

Another analysis of note is the higher exchangeable calcium concentrations with the N-VIRO Soil treatment and the two-fold increase in cation exchange capacity with the N-VIRO Soil treatment as compared to the lime treatment.

## Plant Trace Element Concentrations

No differences were observed in plant uptake of trace elements as a result of either the N-VIRO Soil treatment or lime treatment. Cadmium and lead concentrations were below the detection limit of the instrument used for analysis. There was no treatment effect on copper, nickel or zinc concentrations in plant tissue.

## Conclusions

The use of N-VIRO Soil in reclamation projects is superior to the use of other materials because the properties of N-VIRO Soil contribute to rebuilding a true soil in severely disturbed areas. N-VIRO Soil contains approximately 25% organic matter on average. The presence of organic matter increases water holding capacity and improves soil structure. The addition of N-VIRO Soil also introduces a microorganism population which is similar to that found in natural soils. This is an important characteristic because severely disturbed soils are often sterile. The microorganisms contribute to the breakdown of organic matter into nutrients which also aids the rebuilding process.

While the addition of N-VIRO Soil increases the total trace element content in the soil, these elements are not available for plant uptake as seen in the plant samples taken from this site. Another advantage that N-VIRO Soil has in the reclamation of acidic sites is its high pH. Soil samples taken five and one-half years after N-VIRO application still maintain a pH of above 6.5 while samples taken from the line areas have pH values ranging between 4 and 5.

*editor: N-Viro soil is created with sewage sludge along with cement kiln dust as a main component.*


Snow Pond Farm Supply
RR 2 Box 1009, Belgrade, ME 04917
(800) 768-9998
mail order source for:
certified seed potatoes
organic fertilizers
clodbuster
pebble rock phosphate
azomite
liquid seaweed
kelp meal
greensand
bone meal
tools
alfalfa meal
blood meal
worm castings
soil-building seed
season extenders
organic pest controls
black rock phosphate
diatomaceous earth
call for a catalog or visit our website
http://www.mint.net/snowpond

azomite • greensand • sul-po-mag
rock phosphate • colloidal phosphate
alfalfa meal • blood meal • bone meal • kelp meal
soil-building seed for
green manures & cover crops
5 lbs to truckloads...we ship
anywhere in the continental US
send $1 for catalog to:
Moose Growers Supply
PO Box 520-RE, Waterville, ME 04903-0520

MSC
BULK TRUCK AVAILABILITY OF GRAVEL/ROCK DUST
IN THE U.S. AND E. CANADA AT REASONABLE RATES.
INFORMATION/ORDERING:
310-285-7850
MOSAIC SOIL CO.
11666 Gateway Blvd. Dept. MF1
Los Angeles, CA 90064-2829

A National Aggregate Association Update

# The Aggregate Industry Moves Ahead

*Compiled by Joanna Campe from reports by Rick Meininger and Robert J. Able*

## *Task Force Meeting Held in July*

On July 17, 1995 the NAA held a remineralization Task Force meeting in Beltsville, MD. USDA's Ron Korcak and NAA's Rick Meininger, Vice President of Research, presided over the meeting.

Dr. Ron Korcak reviewed papers he had recently presented, including a report presented at the Society of Mining Engineers. He also provided an overview of his presentation at the 25th Anniversary Conference of *Bicycle* Magazine in Washington, D.C.

*Dr. Ron Korcak speaking with group at the Beltsville meeting on tour of the remineralized plots.*

### The USDA Trials

Dr. Korcak reviewed the data available from the Beltsville Demonstration Plot Study of aggregate mineral fines' use as a soil amendment. The data from this mineral fines study is probably not publishable since this experiment has not been replicated.

The current demonstration plots in Beltsville will be carried out to finish the original three-year plan. The demonstration sites grew corn the first summer, and wheat in winter. Growing was terminated early and the biomass was measured. Soybeans will be grown this summer. The USDA will analyze the plants and the soybeans.

Additional study is needed on the best method to document the advantages of rock and gravel dust; how it can best be handled and spread. Possibly mineral fines could be pelletized with other inputs that might be needed to improve the soil. Pelletizing improves the convenience of handling fines products.

Dr. Ron Korcak led the Task Force on a tour of several sustainable agriculture fields where inputs of a number of waste materials have been employed, including: mineral fines from several aggregate sources, ready mixed concrete truck wash out material, gypsum wall board waste from home building and a number of composted organic inputs.

### Research Workshop

At the meeting, Dr. Bruck, Director of Research Administration at North Carolina State University, pointed out that a large research effort will be needed if the use of mineral fines in agriculture is going to be advanced in the U.S. This effort must involve the land-grant universities which are the basis for improving agriculture in this country through technology. The mechanisms used for integrating mineral fines as a soil component must be researched using very deliberate science. Questions need to be answered about the future use of these fines in commercial agriculture and forestry. Credible, non-biased, published data is needed that will help the USDA, land grant colleges, and county extension agents understand its application. These activities will be necessary to generate a market.

The Task Force proposed that a Workshop be held consisting of researchers from different agriculture disciplines and also including other interests – farmers, nutritionists, aggregate industry, environmental, and equipment manufacturers. The workshop should identify the questions that need to be asked and the research that needs to be done. The Workshop could provide a recommendation on setting up a competitive grant research program on the use of mineral fines in agriculture. An endorsement of such a program from the aggregates industry – through the Center for Aggregate Research (CAR) – would be a first step toward establishing public and private funding mechanisms along with creating a respected advisory board to help recommend and/or administer a competitive grant program. An advocate organization is needed for initiating research and providing the structure to insure that the research is followed through.

**Workshop Update** – In February the proposed Researcher's Workshop at the USDA in Beltsville, Maryland was postponed. Many researchers were unavailable to attend and it appears that more data applicable to remineralization could be published through a rescheduled Workshop. Also, because of federal budgetary government turmoil, the agricultural research

***Mission Statement Draft:***
*[To] Investigate, develop and promote research on the benefits of soil remineralization through the use of aggregate industry mineral fines in agriculture, horticulture, composting and forestry; and to educate aggregate producers and potential users of mineral fines concerning evaluation procedures, product development and utilization.*

community must wait for information on potential USDA programs and funding when budget decisions are made in Washington.

## Current Projects

**Joanna Campe** reported that Remineralize the Earth, Inc. will be doing a study under a grant from the Massachusetts Society for Promoting Agriculture. (See page 17 for update)

**Gary Goodson** reported that Slippery Rock University is expecting a $152,000 grant from Pennsylvania to work with the City of Slippery Rock in composting the city's leaves with added food wastes. They are planning to add mineral fines to help customize the compost and provide needed inorganic inputs.

**Dr. Lee Ingamells**, an agronomist with Tropical Crops Services in Hawaii is conducting seminars on the proper methods of providing calcium for the soil. He wants to work with mineral fines other than conventional pulverized limestone.

**Robert Zick** of Chester Environmental reported on some potential uses of mineral fines in wastewater treatment applications, where mineral inputs will help certain microbes thrive so that they will be able to digest specific organic and inorganic waste.

**Dr. Robert Bruck** indicated that he is working with an aggregate producer to study the effects of a specific mineral fines product. These studies are being carried out in ten states and at eight universities.

He reported they are doing some work on a slow release micronutrient, and he is continuing to track the work with Planter's II on Mt. Mitchell for data on overcoming acid rain effects. N.C. State has now established a new sustainable agriculture farm.

The U.S. Bureau of Mines provided a demonstration of a Geographic Information System to help locate sources of mineral fines and potential use areas in agriculture. Deborah Kramer presented a specific example based on data from Virginia. (See next page)

## *NAA Task Force Meeting in April*

The NAA Task Force on Remineralization meeting in Atlanta took place on April 16, 1995 with 24 attendees. The Chairman is Robert J. Able of Gernatt Gravel Products, Inc., the Vice Chairman is Thomas M. Small of Tilcon Connecticut, Inc. and the Secretary is Richard Meininger of the NAA.

A review was made of a draft mission statement and was modified to read as follows:

"[To] Investigate, develop and promote research on the benefits of soil remineralization through the use of aggregate industry mineral fines in agriculture, horticulture, composting and forestry; and to educate aggregate producers and potential users of mineral fines concerning evaluation procedures, product development and utilization."

The Task Force will continue to test the incorporation of various industry by-products (which included granite, basalt and glacial outwash rock product fines) with the Beltsville, MD, USDA Research demonstration plot, which is in its third and final year. A full evaluation of the data will generate a report on the test at the termination of this project, which is being coordinated by Ron Korcak of the USDA.

Task Force Members will assist in providing materials and review the new USDA Research studies (Beltsville, MD) on composting including the use of mineral fines (screenings). This project is being coordinated by Larry Sikora of the USDA.

The grant to Joanna Campe funded by the Center for Aggregate Research (CAR) and the Aggregate Foundation for Technology, Research and Education (AFTRE) with the Massachusetts Society for Promoting Agriculture will be implemented this Spring. The task force will provide input, assistance and evaluation of the project.

Members of the task force will encourage producers to respond to the CAR "Aggregate data base survey" on fines to determine specific data on the mineralogy, elemental analysis, mechanical analysis, quantities, etc. Data shall be available by August, 1996.

They plan to contact other departments of the USDA, U.S. Forest Service and Bureau of Land Management concerning programs and research they are conducting or could conduct relative to environmental concerns and soil productivity that would relate to SR.

When the USDA Farm Bill is available, they will obtain details to determine possible sources of funding of continued investigation of SR.

They will continue to dialog with various major agricultural research universities and plan to involve several universities in the Research Workshop.

The USDA/CAR/NAA/NSA Research Workshop has been designed to bring together those researchers who can structure or recommend an easily replicated and statistically sound program. The program must answer the major questions about the effectiveness of soil remineralization and develop techniques for its application. This workshop is expected to take place this Fall in Beltsville, MD.

# Selecting Sites for Remineralization

## A Geographic Information Systems Approach

***by Deborah A. Kramer, U.S. Bureau of Mines***

Using Geographic Information Systems (GIS) methods, the US Bureau of Mines (USBM) generated a spatial analysis on using mineral fines produced from aggregate operations to "remineralize" agricultural and forest soils. The use of mineral fines, a byproduct of crushed stone and sand and gravel production, is considered a significant potential resource for replenishing our Nation's agricultural and forest soils.

The USBM contracted with INDUS Corp. of Falls Church, VA, to develop a prototype spatial analysis module, using GIS technology. The use of GIS is important to this analysis because the economic feasibility of potential remineralization efforts relies on the proximity of aggregate operations to agricultural and forest soils requiring replenishment of those minerals. The development of the prototype spatial analysis model, which focused on a 68-county area in Virginia encompassing a 75-mile radius around the city of Richmond. The prototype mode required the identification, acquisition, conversion, and use of various thematic spatial data available from USBM, industry, and other Federal agencies.

*This material has been reprinted with express written permission of* Rock Products *magazine. Reprinted from the October, 1995 issue of* Rock Products *magazine.*

## Methodology

The first step in the preparation of a GIS analysis is to determine the data requirements and to find any publicly available data that meets these requirements. Data used to generate the analysis included a detailed map of Virginia, with transportation infrastructure; latitude and longitude coordinates identifying the sand and gravel and crushed stone operations in the study area, land-use data; soil composition; transportation costs; unit value of the fines at the mine site; and price that the farmer would pay for the fines. Several publicly available sources were used for some of these data. Data sources used were:

- National Resource Inventory (NRI), U.S. Department of Agriculture, Soil Conservation Service for land-use data;
- STATSGO, U.S. Department of Agriculture, Soil Conservation Service for soil composition data;
- 1:1,000,000 DLG (Digital Line Graph), U.S. Department of the Interior, U.S. Geological Survey for the transportation infrastructure;
- Selected non-proprietary data for construction sand and gravel and crushed stone operations, like latitude and longitude and transportation, U.S. Department of the Interior, Bureau of Mines.

After the data is obtained, the next step is to convert all the data to the same format so it can be integrated in GIS computer software. INDUS designed and developed the prototype spatial analysis model in MapInfo 3.0 for Windows1 using the MapBasic development environment. The MapBasic development environment allowed INDUS to create a user-friendly menu interface with interactive dialog boxes and next-step message windows. The model is designed to provide three different transportation scenarios — roads, railroads, and waterways.

The user must provide some information for input to the application. This includes: identifying the mining operation to run through the model, selecting a transportation mode (the applications will allow only the transportation options that are accessible to the mining operation), and entering the product costs and transportation costs into the model to calculate the maxi-

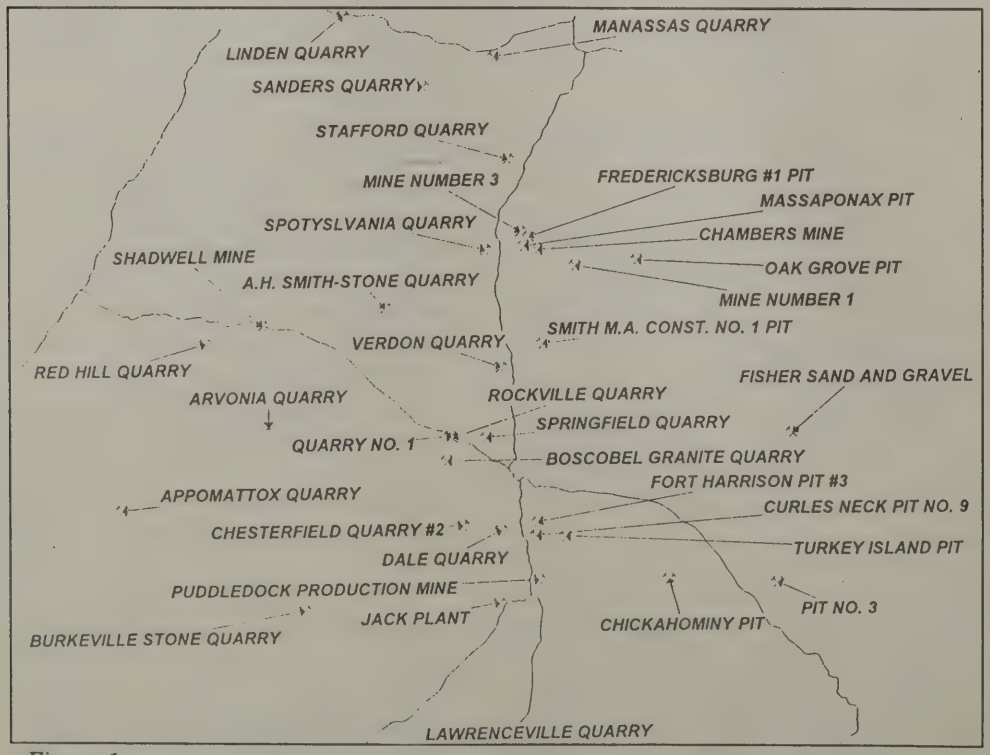



*Figure 1*

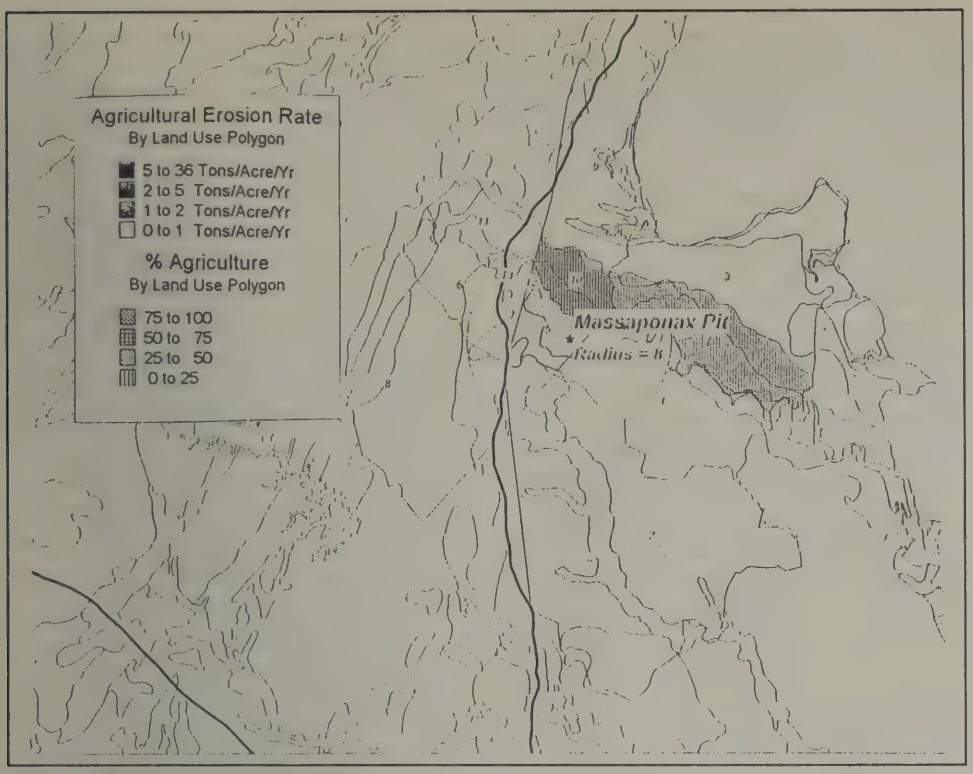



*Figure 2*

mum economic distance that the fines can be transported and still maintain a profit or break-even point for the mine operator.

The model generates the maximum economic distance, which is a radius distance from the mining operation. This radius serves as an indicator of the economic feasibility of using fines from a specific mining operation to replenish soils in specific areas requiring replenishment and remineralization. For roads, the model calculates a radius distance, and the application automatically creates a circle buffer around the mining operation defining the maximum distance. For railroads and waterways, the model calculates a radius distance, and the application automatically creates a circle buffer to help the user to interactively select the appropriate railroads or waterways within the correct distance from the mining operation.

From the data that the user provides and the publicly available data sources cited above, specific data were extracted and map layers containing the individual data sets were created. The GIS software allows these layers to be superimposed. This means that for specific criteria, a map can be generated that contains all the data that meet the criteria.

One of the key elements in developing a meaningful analysis was the creation of a set of land-use polygons from the available data. INDUS developed a land-use polygon coverage derived from the NRI, consisting of approximately 800,000 sample points with more than 200 land-use variables collected throughout the United States. The X and Y coordinates of the sample points are confidential, and the only location information provided for each sample point includes the FIPS county code, hydrologic unit code (HUC) and major land resource area (MLRA) code. Therefore, in order to obtain the smallest geographical unit to perform analysis on the NRI data, INDUS developed a combined geographic boundary file in MapInfo by intersecting the country, MLRA, and HUC boundaries together to develop new "land use" polygons. The county, MLRA, and HUC codes also were merged together to create a unique identification number for each land-use polygon. lNDUS used MapInfo to aggregate the NRI data for all sample points that share the same county, MLRA, and HUC codes to create a weighted file of unique records that included information on total land area, total agricultural land area, percent agriculture, total erosion, erosion rate (tons/acre/year) for each newly created land-use polygon. As a result, the prototype application automatically relates the land-use polygons with the aggregated NRI data using the combined county, MLRA, and HUC codes.

For the prototype application, MapInfo was programmed to generate a map portraying the locations, percent agricultural land use *and* soil erosion rates of selected land-use polygons. The map shows the location of the mining operation and the circle buffer, land-use polygons, soil polygons, and selected transportation features (highways, railroads, and waterways). In addition, land-use polygons are labeled to allow for easy cross reference to the database report.

MapInfo also generates a database report from the overlay of the circle buffer and the selected land-use polygons and STATSGO soil polygons. For each selected land-use polygon within the maximum transportation distance, this report contains specific detailed data, such as percent agricultural land use, agricultural soil erosion rate, etc. The soil polygon IDs are provided to allow the user to look up mineralogy for each soil polygon in the mineralogy look-up table, generated from STATSGO data.

## Example

After opening the module in the MapInfo program, a map of the study area appears on the screen showing all the operations in the area. In an interactive dialog box, the user is asked to select a specific site for analysis. After choosing the individual operation, the user then is asked to select the mode of transportation – road, rail, or water. Only valid transportation methods are selected; for example, if the operation is not near a waterway, the water transportation option is not available. The user is asked to provide three other pieces of information – the value of the material, f.o.b. plant; the expected market selling price of the material; and the transportation cost, in dollars/ton/mile. From this cost informa-

tion, the model calculates a maximum distance that the material can be transported and still generate a profit for the mine operator. In the example, the Massaponax Pit is selected from the operations in the area, road is selected as the transportation mode, and the cost parameters are as follows; f.o.b. plant cost, $8 per ton; market price, $10 per ton; and transportation cost, $0.25 per ton per mile. From this information, the program calculates a threshold shipping radius of eight miles.

Because of the road density in the study area, it was assumed that the shipping distance would be the radius of a circle, rather than a specific distance along roads in the area. In less dense areas, individual road maps (available from the DLG 1: 1,000,000 data) would be an additional set of data that would need to be analyzed to determine the threshold shipping distance. Additional programming to complete this function would be required.

After this calculation is completed the program generates a map showing the land-use polygons that fall within the calculated radius of the mine. For the Massaponax Pit, 13 land-use polygons are either all or partly contained in an 8-mile radius from the mine (figure 2). By the color code and cross hatching patterns in the polygons, it is apparent that polygons number 5 and 10 show the most promiise as potential sites for remineralization. Polygon 5 has between 75% to 100% agricultural use and a 2 to 5 tons/acre/year erosion rate. Polygon 10 has a higher agricultural erosion rate (5 to 36 tons/acre/year) but a lower agricultural usage (50% to 75%).

To obtain more detail about these land-use polygons, the program also generates a file that contains information on the polygon area, the overlap area (area within the specified radius from the mine), the distance from the mine to the center of the land-use polygon (in miles and kilometers), the actual percentage agricultural use and erosion rate, and soil composition information. The columns "muid1" to "muid5" provide some soil composition information that has been extracted from the STATSGO data. The code numbers in these columns refer to data in a table that INDUS generated, which is available as a hard-copy lookup table.

For this specific example, the Massaponax pit operator would know that within an eight-mile radius from the mine, the areas that would have the most potential for sale of the mineral fines generated at the mine would be a 50-square-mile area to the north and east of the mine. The operator might want to confine marketing efforts to this region.

There are some limitations to this analysis. Because specific NRI data points (the source of the percent agricultural use and erosion rate data) are confidential, the NRI information is generalized for an area. If, for example, a land-use polygon shows 75% agricultural use, the user does not know which 75% of the polygon is agricultural use. The model will, however, show the most promising areas for remineralization. The STATSGO data has some of the same limitations that the NRI data has because of generalization of data, and much of the soil composition is considered mixed, which provides little useful information to the program user. Data on waterways shows all the waterways in the area; the data make no distinction between navigable and nonnavigable waterways.

## Conclusion

This prototype shows the potential role for GIS analysis in remineralization studies. Although the model has some limitations, it provides very useful data, particularly to the mine operator, about potential outlets for mineral fines. GIS also has the advantage of being able to run on a personal computer, not a mainframe or even a minicomputer. In addition, commercial GIS analysis systems are available from other sources for farmers for site-specific crop nutrient management. This information, used in concert with the information presented in the prototype analysis, can show a win-win situation for both the farmer and the mine operator. At the same time, because of growing interest in GIS systems, more and more detailed GIS-based data are becoming available In the future, more detailed data may mitigate some of the limitations inherent in this prototype analysis.

[1]*Use of specific trade names does not imply endorsement by the Bureau of Mines.*

**Remineralize with**

**AZOMITE™**

NATURAL SOURCE OF MINERALS AND TRACE ELEMENTS FOR PLANT NUTRITION AND GROWTH
Produced Since 1942

To order or for more information contact:

**PEAK MINERALS - AZOMITE INC.**
205 Eagle Point Drive
Branson, MO 65616
Off: (417) 336-6666
FAX: (417) 336-6630

**Featured In**

**"SECRETS OF THE SOIL"**

# GLACIAL FLOUR

***by William Peavy, Ph.D.***

*Dr. Wm Peavy working with one of his power-charged mineral beds. (3/92)*

Rock powder is also known as rock dust, rock flour, glacial flour, and gravel dust. It is referred to as broad spectrum because it usually contains many different elements. There are two kinds of rock dust: man-made and natural. The natural kind was deposited by melting glaciers thousands of years ago. Another natural kind is being made at this very moment on certain high elevation mountain sides by active glaciers.

A glacier is a slowly moving river of ice in a valley on a high mountain. Some glaciers are over a mile thick. As they slide down the mountain, they pick up rocks and mineral particles that grind other mineral particles out of solid rock. At some point halfway down the mountain, when summer comes, the glacial ice begins to melt which releases water that turns a milky color by the finely ground glacial dust.

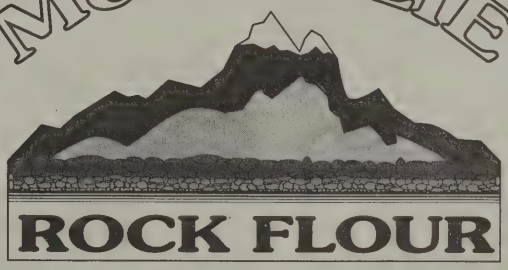
Some of the particles of glacial milk have been found by electron microscope study to be less than one micron (0.0004 inch) in diameter (according to Dr. W. D., Keller of the University of Missouri, in an article in the Aug., 1960, issue of Organic Gardening). The glacial milk has small particles indeed when you compare them with 200 mesh size which is 0.005 inch or even 400 mesh which is 0.0025 inch in diameter. Glacial milk particles are one/sixth the size of 400 mesh particles!

We visited an attractive glacier on the slopes of Mt. Rainier in Washington State several years ago. You must wait until July when it gets warm enough to melt ice on the mountain. In July, at snow melt time, we saw the milky-white water flowing out of the glacier in Mt. Rainier National Park about 50 miles southeast of Tacoma, Washington. To see this you take Interstate 5 north, exit on route 12, and later turn north on route 123. The route changes to number 10, then a few miles north, take the Sunrise Ranger Station exit, then the hiking trail that leads up to Emmons Glacier.

The same milky water can be seen flowing down Nisqually River as it runs west out of the park along highway 706. If you want to collect some glacial flour, exit Interstate 5 going north on route 12. Watch for the town Randle where you will see the Cowlitz River along the highway. From there up to the town Packwood, you drive along the Cowlitz River which turns milky in July. Along its banks you can see the milky water in a glass jar and set it on a window sill. From 48 to 72 hours are required for all the particles to settle out, meaning some of the particles are colloidal.

*Dr. Peavy does research on remineralization of the soil and includes this in his book,* Super Nutrition Gardening, *which can be ordered by sending him a check for $17.95 and sending it to 316 Horton Ln., NW ALBQ, NM 87114.*


McKENZIE



ROCK FLOUR

*Nature's Own Natural Plant Food*

*Loved by your plants. Hated by bugs and slugs.*

Now Available:

| | |
|---|---|
| **6# Plastic Pails** | $ 5.95 Ea |
| **1 Case of 8 Ea 6# Plastic Pails** | $39.95 Ea |
| *An Ideal Gift For Your Friends* | |
| **50# Bags** | $12.95 Ea |

Order Today: Cash, Check or Money Order.
Shipped UPS, Freight Collect

Remineralization Products Inc.
P.O. Box 70183 Eugene, OR 97401

# Arbor Day Celebration at Belmont Library

***by Don Weaver***

*Children sprinkling rock dust around a tree for an Arbor Day planting in Belmont, CA, 3/6/96*

Thanks to the fruit tree donations by Dave Wilson Nursery and distribution efforts of Peninsula Re-leaf/ Magic Inc., another 2,000 fruit trees were placed into the eager and happy hands of San Francisco Peninsula school children who volunteered to "adopt" them. This brings the total to about 22,000 over the past 6 years. I assisted librarian Cathy Cheek at the Belmont Library celebration where we gave away 80 trees with care instructions and of course a small bag of rock dust to help the trees off to a healthy start. We also had tree stories, skits and dances. I learned to appreciate trees (and children!) more than ever.

We also did a special library planting of a dogwood tree with Ken Himes of Belmont Parks and Recreation leading the ceremony and most of Leslie Marx's dance troupe girls helping as much as they possibly could. Such gleeful exuberance to give the dear tree friend plenty of rock dust (Spiral Stonemeal) so it would be well and happy too. I can't help hoping such natural enthusiastic giving will eventually prove contagious and spread throughout the adult population, as it began to this day. And I hope the picture of the dogwood ceremony gives a glimpse of the sacred beauty of these moments of hope, action, regeneration and pure-hearted fun.


REMINERALIZING WESTERN SOILS

with

SPIRAL STONEMEAL

VOLCANIC AND GLACIAL ROCK DUST
offers a BROAD SPECTRUM OF MINERALS
INCLUDING IMPORTANT TRACE ELEMENTS

*For:*

- *Larger Plants, More Vigorous Growth*
- *Increased Flower and Fruit Production*
- *Better Pest Resistance*
- *Less Sensitivity to Environmental Stress*
- *Greater Nutritional Value*
- *Stronger Fragrance*
- *More Vibrant Colors*

SPIRAL STONEMEAL IS A TOP QUALITY MATERIAL--COMPARE OUR ANALYSIS

SPIRAL STONEMEAL P.O. BOX 2104 CUPERTINO, CA 95015 1-800-253-8710

# Trace Elements: Missing Links

## *with a commentary by David Yarrow*

*Dr. G. H. Earp-Thomas, noted New Jersey scientist, pioneered work with minerals in 40 years of research. He first produced legume innoculant for commercial sale, and developed an instrument sensitive enough to measure trace elements in soil. With it, he demonstrated New Jersey feeds and soils were losing trace elements in 1908. His statement is worth review today:*

It takes many years for a momentous discovery to achieve full significance. When I made a kinetic analysis device to determine available soil elements, I didn't realize someday it would save tens of thousands of animal and human lives. In plant tests, I noticed soil that appeared similar in mechanical structure and chemical nature often produced dissimilar crops, showing a difference somewhere in soils' intricate chemical composition.

In 1905 I had time to test crops. I noticed variation in crop growth in what seemed similar soil; I began research to discover the reason. Animal feeding tests showed conclusive nutrition differences in food grown on various soils. Mice were fed foods grown on New Jersey soils; others similar foods from other states. In months some fed only food from NJ soils had several diseases; some developed cancers.

Cancers interested me to no end. Cancers in mice fed poor food grew readily; cancerous mice fed food from good soil rarely got worse and often got better. Analysis showed several deficient elements – surprisingly, calcium and magnesium – and trace elements copper, boron, zinc, manganese, cobalt, and molybdenum. My view such deficiencies might cause disease was ridiculed. Scientists said minerals are abundant in all soils.

Making a mineral combination including most low or missing in soils was more difficult than I anticipated. Some were incompatible and wouldn't make a combination. I sought advice on the question, but could get none.

By 1908 I succeeded making a mineral solution using bacteria from rotten rock. Bacteria grown in an incubator with dilute solution of elements generally missing from soil made a balanced solution. Without organic matter or sugars, the bacteria grew well in mineral salts and transformed elements into new organic compounds. The result is a zooglea, or gum-jelly. Evaporating some of the water made a concentrated product, nearly sterile due to its osmotic pressure.

This quality was extremely important to overcome blood infection in patients and prevent colds. But we didn't know that till much later when minerals were used by doctors on patients with diseases and malignancies, and people wrote to say the minerals relieved colds and warded them off. These enthusiasts told friends and more people heard of the benefits. We couldn't report this because results couldn't be scientifically checked.

Now these results are absolutely confirmed by remarkable work by Drs. William A. Albrecht and Ira Allison of Missouri University, and also by Merck and Co. later. Cases related by Albrecht and Allison took up to five months to cure chronic diseases. But if minerals are taken in concentrated doses, blood rapidly becomes unfit food for disease germs and they rapidly die.

That shows what a long time must elapse between a discovery and its practical use. Even now, although animal and human diseases were cured by simple minerals as food, it will be at least ten years before this is understood and adopted by medicine.

During a crisis, minerals are liberated in the blood- and invading germs are killed. I believe rapid killing is from increased osmotic pressure brought by the minerals – also electric potential from negative to positive. I believe a potentiometer will show negative charge causes death, as all dead people are acid (negative); living people alkaline (positive). This, I believe, is immutable law of nature – like gravity.

That being so, no one can be dead if they are alkaline. In cases where death was eminent (complete coma and heart collapse), minerals only were given every ten minutes for one to three hours. Blueness (cyanosis) left, heart resumed normal beat, and sufferers recovered. Convalescence, of course, took weeks in some cases.

There were enough cases to leave little doubt in my mind. One – an important engineer – had 19 doctors for a stomach tumor. When he began to fail despite the doctors, I was called. He was vomiting everything – the day I was there he expelled a green liquid. After mineral solution intake, he made steady progress, and is a well, vigorous man today, head of an international organization.

His wife had peritonitis. Two famous New York doctors couldn't operate due to her infected gall bladder. They suggested I feed her minerals, and when she was well enough, they'd remove the gall bladder. Soon after minerals were administered her fever began to recede, so I left. Months later her nephew said she still had her gall bladder. She refused the operation, saying if infection was stopped at its worst, she certainly wouldn't permit removal.

My experience is too sketchy, due to heavy duties in other fields, to have significance, but results I'm familiar with are encouraging. Since Missouri University absolutely confirmed the benefits of minerals, I believe my

promises of minerals are well founded. Time alone will tell.

It is likely in the future a large chemical company will put out a blaze of advertising promoting their great new mineral discovery. It needs something sensational to interest the world. Just fancy, if this mineral theory is true, how great it will be. It will overcome a high percent of chronic, painful diseases, and almost eliminate deficiency diseases now increasing at alarming rates.

In time, minerals will come to us naturally from food grown in well balanced, regenerated soil.

## Commentary

*Nearly a century later, neither medicine nor agriculture has heeded Dr. Earp-Thomas, who thought "it will be at least ten years..." Today, soils continue to be destroyed by annual plowing, harsh chemical fertilizers and toxic pesticides. And trace elements decline, if not vanish. Soil ecosystems unravel; bacteria, algae, earthworms, and insects vanish; plants are weak, susceptible to disease and pests; feeds and foods lack mineral nutrients.*

*Medicine, too, fixated on its own "cut, burn & poison" technologies, ignores minerals, vitamins, nutrient, and diet therapy.*

*Dr. Earp-Thomas used bacteria from rotting rock to stabilize his trace element solution. In Nature, it's bacteria that dissolve rock to digest minerals into living protoplasm. These evolutionary pioneers create food and habitat for other lifeforms – especially plants. One example: lichen encrusting boulders are a partnership –a symbiosis – of bacteria and algae. Bacteria eat rock to feed algae minerals; algae fix sunlight as six-carbon rings called sugar to feed bacteria.*

*So plants depend on bacteria to digest and supply minerals packaged as protoplasm. Dr. Earp-Thomas also pioneered using bacteria to inoculate legumes. Rhizobia bacteria live in pink nodules on legume roots. Rhizobia don't eat rock, but use a trace element, molybdenum, to fix the element nitrogen from air into nitrates, which legumes make into proteins.*

*In the '70s John Hamaker said soil remineralized with rock dust has a population explosion of bacteria feeding on the minerals. The bacteria alter soil tilth, water retention and nutrient capacity. Earp-Thomas would agree.*

*But both Earp-Thomas and Hamaker underestimated the complexity of soil life. Since each of them, science has learned volumes worth millions about soil life, yet understands less. So don't wait for science, agriculture or medicine to prove and embrace trace minerals. Do what Earp-Thomas, Hamaker and many others have done: Try it and see for yourself.*

*Experience is the best teacher. Seeing is believing. Just do it.*


# The Enlivened Rock Powders

***by Harvey Lisle***

***Dusts of the Soil***

*" Standing on the shoulders of giants... Harvey Lisle has captured for us both the physical and the spiritual connection that links rock powders – specifically enlivened rock powders – to life, to agriculture, to cell and plant development. By taking crop production away from single-factor analysis, Harvey Lisle has caused us all to consider anew the sacred text: dust thou art, and into dust thou shall return."*

**Charles Walters**

Chapters include information about silica, lime, clay, and zeolite rock powders; enlivening and balancing the soil; sustainable agriculture; radionic amplification of paramagnetic forces; neutralizing noxious forces; biodynamic forces and dowsing.

*Softcover, 208 pages.*
#6103...$15.00 + $1.50 shipping ($3.00 intl)

From: *Acres, U.S.A., A Voice for Eco-Agriculture,* P.O. Box 8800, Metairie, LA 70011 (504) 889-2100 Fax (504) 889-2777

**K-IDA-AG**

# The Best Health Starts *with the* Best Food

*An amazing soil rejuvenation product made up of highly energized minerals along with bacteria and other high energy materials for nutritious crops.*

**K-IDA-AG Soil Conditioner:**

For a 500/sq. ft. garden $35.00 = S&H ($5.00 UPS)

For a 1,000/sq. ft. garden $60.00 = S&H ($10.00 UPS)

For a 2,000/sq. ft. garden $100 +S&H ($10.00 UPS)

**Kenneth Hahn**
**2540 Smith Road**
**American Falls, ID 83211**
**(208) 226-5884**
**1-800-727-5884**
**(outside Idaho)**

Trace Minerals, Soil & Life

# Secret Solution for Health

*by David Yarrow*

August 6, 1992, while visiting a friend in southwest Wisconsin, my left hand brushed a 6000-volt powerline. Knocked unconscious, I fell fifteen feet onto my upper back, fracturing ribs and vetebrae, and crushing T-5 in my spine. I landed nearly beside two paramedics — first of many angels who have pulled me back from certain death. Flown by helicopter to the University of Wisconsin Hospital in Madison, surgeons cleaned my burns and grafted skin on my scorched arm.

Five days later I emerged to consciousness with respirator, catheter and IV. For five weeks morphine filled my sleepless mind with visions, then surgeons cut my chest open to splice my shattered spine together. Then began six months in a Rehab Unit; a month passed before I was allowed to even sit up.

I remember in the Burn Unit I would sweat profusely every night. Later, in Rehab, I began to pass a lot of urine at night. Slowly this nightly flow increased until my kidneys became a fountain. Most nights I woke three, four, even five times, often passing 1,000 or more cc's.

In January 1994 acupuncturist Doug Klapper heard my tale, took my twelve pulses and gave a simple diagnosis. He said, in part, my kidneys are short circuited. Whether from electric shock or medication, my kidneys were unable to regulate fluid in my blood and body.

In Oriental medicine kidneys govern the bones — the mineral reservior in our body. The flood of water out my bladder was draining minerals from my body.

Then, in February 1995 Joanna Campe sent a gallon of Trace-Lyte™ (trace mineral electrolytes) from Naturopathic Research.

Eight years ago Dr. Gerald Olarsh was struck by lightning. He survived, but suffered disabling after-effects. For months Jerry sought help from a succession of specialists, all the way to the Mayo Clinic. He found no relief and remained medically untreatable.

Then his son, a Naturopathic physician in New Hampshire, found a formula for a special solution of trace minerals used with cancer patients in the '30s. The Formula, now known as Trace-Lyte™, product of 30-year soil and mineral research, is produced by a time-consuming incubation where minerals literally "grow" together in water.

In *Electrolytes: The Spark of Life* Gillian Martlew, ND writes: "It takes a week to make a batch. Combined in a specific way over a precise period, an implosion occurs, creating an energy so strong minerals change form — to crystaloids — uniquely able to filter through tissue directly into cells. Their potenial is extraordinary — the beginning of mineral action in the body. They're electric — they're alive."

Jerry made a batch and began taking teaspoons a day. In three months he knew this was his road to recovery. In six months he was well enough to resume work, so he began to make and sell Trace-Lyte™. With minimal publicity, every week he would get orders for gallons from doctors who prescribed Trace-Lyte™ for their patients.

I began taking TraceLyte™ in springwater — a quarter cup in a quart. In three days, my nightly urine flow diminished. In a week I slept all night without waking for the first time in two years.

My urine flow remained diminished for three weeks until I stopped taking Trace-Lyte™ for two days. Nightly urine increased for two nights until I resumed Trace-Lyte™. Another positive sign was rapid healing of scrapes to my feet and lower legs.

Kidneys are electric organs; they regulate electrolytes in blood. Electrolytes are atoms which gain or lose one or more electrons — the common currency of chemistry and life. With electric charge, atoms are ions, which allow chemical reactions. Cations lose electrons to be positive (H+, Na+, K+, Mg++, Ca++, Fe+++); anions gain electrons to be negative (OH-, Cl-, $CO_3$=, $SO_4$=, $NO_3$=).

A primary chemical reaction is acid (+ ion) plus alkaline (- ion) yields salt and water. For example, hydrochloric acid (H+Cl-) and sodium hydroxide (Na+OH-) produce sodium chloride (Na+Cl-) — common salt and water ($H_2O$). In this way kidneys regulate blood electrolytes, and excrete water and salts via the bladder.

My kidneys have begun to recharge. Like a deeply discharged battery, this will take some time — many months. Full recovery may require three or four years. As my kidneys strengthen, they can complete the healing of my still damaged rib bones.

## Recovery and Rock Dust

George Broeckx has cared for me much of my 30 month struggle to survive and recover. One of his many talents is a green thumb. Avid organic gardener, his experiences with a small farm and "ecologically friendly" landscaping taught him the value of trace minerals to soils and plants.

One organic practice is foliar feeding — spraying liquified seaweed on leaves. Trace minerals and growth hormones absorb directly into plant cells. Foliar feeding is proven so effective chemical growers now regularly use it, too. Research shows it stimulates nutrient uptake by roots — so nutrients must be in soil.

To be sure all 20 essential minerals are in his soils, George blends Planters II, a trace mineral fertillizer, in his lawn and garden fertilizing mixes. He finds it especially effective to nurse seedings. But its best effect is to enhance microbial activity.

A dedicated recycler, George composts garbage from two restaurants at his farm and Capital District Community Gardens. He does it for

***Every weekday beginning 6:30 am dump trucks chug past my door hauling sand & gravel over the hill to construction sites. Every day I wonder when they'll carry fines to spread on farmland to grow our food.***

personal satisfaction to reduce waste and create new topsoil. "A grower's first job is to make topsoil," says George, "to instill dirt with fertility and life. Sadly, modern farming rapidly destroyed one of our most critical resources."

George's topsoil recipe mixes garbage with manure, leaves — and rock dust. Feeding mineral powder to compost is the fastest way to transform stones to living protoplasm. Micro-organisms (and earthworms) eat raw minerals to form nutrients easily edible by roots, and create special substances needed by plants and animals. Compost is a metropolis of microbes digesting minerals and cellulose — an industrial park of factories recycling wastes into plant food.

Planters II dramatically boosts growth vigor, producing compact, sturdy plants with darker color, better disease and pest resistance, stronger frost hardiness. Most of all, it stimulates flowering and seeds — plant reproduction. But to gardeners, the ultimate benefit is foods have richer, deeper, better flavor. Not only taste improves; nutrients increase, too. Not only all the minerals, but proteins and sugars increase. In carrots, 11% more sugar is common. A bushel of grain weighs more due to higher mineral levels. George is so impressed with Planters II he distributes it in the Capital region.

Planters II is a "high test" rock dust mined from a unique deposit near Salida, Colorado by U.S. Soils Co. It has 35 elements — everything from nitrogen to zinc — with high concentrations of the 20 trace elements plants need. Most are in soluble form easily digested by soil microbes and roots. With 50 years experience, U.S. Soils has case histories and field data from farms in almost every state.

Other rock dusts can supply trace elements to microbes and plants. Success is had with basalt, traprock, granite, lava, and other rock dust products. Few are as soluble or concentrated as Planters II.

In *The Survival of Civilization,* John Hamaker, father of modern remineralization, urged using glacial gravel dust.

Robert Able is Sales Manager of Gernatt Gravel Co., NY's largest sand & gravel producer. Gernatt dredges seven glacial deposits near Buffalo to crush and grade into sizes of gravel and sand. Bob, also a NY Director of the National Aggregate Assoc. (NAA – the sand and gravel industry trade group) was concerned the industry should address the ecological issues pressing our future.

Processing gravel creates 5-15% dust-size (#200 mesh) by-product. A typical 2-500,000 ton/year facility makes 10-75,000 tons of these fines. In 1991 the industry generated 124 million tons of by-product with very few uses — waste to be disposed of — usually landfilled as tailings nearby as a production cost.

In 1991 Dan Winter bought a dump load of this waste from Bob for Crystal Hill Farm. Dan's talk about SR with glacial gravel dust as a response to the greenhouse effect roused Bob's interest to meet with me. In June 1992, before my brush with death, I assembled a 30-page proposal for Bob to present to NAA.

We suggested NAA fund research to use fines in agriculture, forestry and large scale composting. We urged NAA to: 1) research practical, economic uses of fines, 2) support widespread application of tested, proven tailings on farms and forests, and 3) promote this publicly and in government.

In July Bob presented it to the Research Committee at NAA's annual meeting in Washington, DC. Response was positive and enthusiastic. Ample volunteers formed an implementation committee. Donald Weaver, co-author of *The Survival of Civilization,* was invited to speak on SR at the next NAA convention.

While I was in the hospital, Bob called to report on the proposal's progress. NAA chose Texas A&M as their research center and began discussing how to research using fines. The proposal sparked wide interest and led to discussions at the USDA, U.S. Bureau of Mines, HUD, and other stone industries.

May 24th, 1994 the USDA Research Center in Beltsville, MD held a first-ever conference on Soil Remineralization and Sustainable Agiculture. More than a dozen scientists, activists and industry representatives presented papers.

- Greg Watson, Northeast Director of Nature Conservancy and former MA Ag Commissioner and New Alchemy Institute Director described SR concepts and history.
- Joanna Campe's global view ranged from European research in agriculture and regenerating forests dead from acid rain to Men of the Trees using granite dust to plant trees in arid western Australia.
- Dr. Robert Bruck, NCSU plant pathologist and NC Director of Environment, described success using Planters II to replant dead boreal forests atop the highest Appalachian peaks.

Dan Winter videotaped the talks for Crystal Hill Multimedia.

Since May 24, 1994 events are slowly moving this remineralization effort forward. In 1994 USDA field tested several rock powders at its Beltsville Research Center. NAA's Research Committee continues discussing research goals and protocols and Bob Able, not waiting for NAA's research plan, has local farmers cooperating to test fines from Gernatt mines. Early results are promising.

My home for this winter is on a hill above a gravel quarry across the Hudson River from the Empire State Capitol. Every weekday beginning 6:30 am dump trucks chug past my door hauling sand and gravel over the hill to construction sites. Every day I wonder when they'll carry fines to spread on farmland to grow our food.

And are we wise enough to remineralize forests to keep our planet cool and green?

WITH SO MANY FORMULAS TO CHOOSE FROM...

# Why Trace-Lyte's™ CRYSTALLOID True Broad-Scope Liquid Electrolyte Formula?

BECAUSE it is a true crystalloid structure, rather than larger colloidial particles.

BECAUSE of crystalloid structure it will penetrate through soft tissues in your body as you drink it.

BECAUSE the purity of the minerals is controlled. There is no contamination of heavy metals in the formula.

BECAUSE it took 30 years of research to develop and one week to make. We know it works.

Health Thru Naturopathic Research
TRACE-LYTE
LIQUID MINERALS
A True Broad-Scope Electrolyte Formula Designed for Rapid Absorption
NATURES'S PATH™
HOMEOPATHIC FORMULA
Nature, Time and Patience Are The Three Great Healers
FORMULA 10
16 FL. OZ. (457 ml)

BECAUSE of our depleted soils we also know that as a thinking, self responsible being, for you it's a must.

BECAUSE we give it to our grandchildren, you know there is nothing better on the market.

**TRACE-LYTE™**
**Liquid Minerals**
***A TRUE CRYSTALLOID***
**Electrolyte Solution!**

"Health Thru Naturopathic Research"

• Nature
• Time
• Patience

**941-426-3375**

**NATURE'S PATH™**

**P.O. Box 7862, Venice, FL 34287**

# Planters II

## *a unique source of minerals*

***by Jack Watkins, Vice President of U.S. Soils***

Found high in the Colorado Rockies, surrounded by geothermal hot springs that have heated it in a natural crock-pot for millions of years, Planters II is nature's solution to the ever present problem of remineralization for farmers. Equally important in reforestation programs, Planters II is fast becoming one of the mainstays in studies of soil improvement programs. Having all the attributes of rock dust, plus additional elements such as vitamin $B^{12}$ and other mysterious activators, Planters II is making believers of previous non-believers.

### The Future Is Now

U.S. Soil, the manufacturer of Planters II is not new in the market place. Our product has been in place for millions of years, and U.S. Soil has been developing it for approximately fifty years. A family emergency situation caused a slowdown in development and production for about ten years, but everything is in full force now with an all out marketing program. The manufacturing plant is ready for full operation, and with a reserve of some five to fifteen million tons of product available for processing, it's full speed ahead. Still owned by the Lionelle family of Salida, Colorado, with many years of experience to call on, the future is now for Planters II.

Primarily assigned to the domestic United States market, the company is now considering export trade opportunities. Contracts are being explored with both government and private enterprises in countries such as the Philippines, Japan, China, Australia and Mexico.

Planters II is a 100% organic trace mineral (plus) fertilizer proving to be extremely effective for farming and reforestation projects and much more, especially golf course greens. One recent trial effort on a golf course brought forth an inquiry, "It grows grass too fast, how do you control it?" Our answer: "use less." Being highly water soluble, Planters II is quickly absorbed into the root structure of plants and grass, and therein lies one of the major strengths of the product. Better and stronger root systems equate into better, stronger, and more productive plant life. Be it a sprig of grass, or a giant tree in the forest, the effects of Planters II will be noticed.

Planters II is certified 100% organic in the state of Colorado and in other western states. In its pure and basic form, for new and established reforestation projects and as an animal supplement, it is marketed as ELX. Animals seem to love it, and it does wonders for their basic health and growth.

It has been said since the beginning that nature is the best healer. This is certainly true for Planters II. This isolated pocket of nature in the Colorado Rockies consisting of the remains of an ancient ocean that existed millions of years ago, proves that when nothing else will solve the problems, nature will!


**Planters II**
**Trace Mineral**
**Fertilizer**

Distributed by
**Roylance Environments**
**recently featured in**
***Martha Stewart Living* magazine**

**Rte. 1, Box 1398 Dogwood St.**
**Sag Harbor, NY 11963**
**(516) 725-1009**



**ROCK DUST**
**For Your Garden**
***in Western Oregon***
*(You Pick-Up or We Can Deliver, if not too far)*
**1-(541)-942-DUST (=3878)**
Roger & Gayle Kahane
72650 London Road, Cottage Grove, OR 97424


## Using "Naturals" Scientifically Improves Ag Profits, Environment

Throughout the past 29 years, U.S. and overseas food, feed forage and fibre producers, by judiciously combining scientific knowledge and natural materials, have been enjoying "low input, high yield crops" – too often when conventionally farming neighbors blamed drought for their crop failures.

Philip Wagler, Partridge, Kansas, for example, has realized $990 an acre income from alfalfa and seed. His neighbors, according to the extension advisor for Reno County, "no longer even try to grow alfalfa."

Costa Rican growers are paid $10 a box for their "scientifically Remineralized and Biologically Reactivated Soils" grown bananas. Conventionally fertilized bananas bring only $5.

How much more $C0_2$ is "fixed" by a $990 an acre crop of alfalfa than is fixed with a 17-bushel crop of wheat? Or by a 225-bushel crop of corn as contrasted with adjacent crop failures?


**Agronics, Inc.**
701 Madison NE
Albuquerque, NM 87110
Phone (505) 298-1748

# Digestit Digests Odors Benefitting Both Dairies and the Surrounding Residential Neighborhoods

## Zhenya Delate looks at a Leland Taylor Report

Leland Taylor of Fertimax reports that dairies are finding themselves in "Catch 22" situations created by lawmakers and EPA enforcers. The dairies are being heavily fined for land pollution and atmospheric contamination caused by large quantities of manure, yet they are prohibited from hauling those mountains of manure off through residential areas constructed after the dairies started operation.

Huge sums have been expended in attempts to find techniques for dealing with such facilities. Grants in seven figure digits are regularly given for such research and development. Both "dry" and "wet" manure handling proposals have thus far been expensive and ineffective. Since those profiting from the construction of such facilities and agstaffers have gained control of the construction markets so completely, there has been no further information released on the possibilities of producing "dry" manure or disposing of it in any way but "the lagoon" method.

Then Digestit, a pulverized shale product, was tested as a means of deodorizing cow manure. Larry Kuykendall, an operator of a "small" 700-cow dairy in Dexter, New Mexico was persuaded to conduct a half-herd test. Five days later he reported that "The manure from the test cows simply has no objectionable odor. The 'frosting' (caused by ammonia in the manure) has disappeared, the manure is firmer (drier), the cows look recognizably better and they're friskier."

At the end of the supplementing test, the "test" animals were averaging 10 pounds more milk per day. Mr. Kuykendall's friend called from California to rush order 100 pounds by UPS for his sick calves. So impressed with the results of supplementing his herd with Digestit, he took manure samples to the Southern California EPA office. Kuykendall reported, "They really got excited. They volunteered full assistance in making scientific determinations in their laboratory; to send their scientists out to make on-site observations; to measure scientifically the comparative levels of atmospheric contamination and all sorts of other stuff which is gobbledygook to me."

Long-time users Glen Everett, Gnadenhutten, Ohio; Amos Martin, Dayton, Virginia; John F. Esh, Peach Bottom, Pennsylvania and scores of others, have improved their "good neighbor" relationships by eliminating dairy and other livestock odors, and setting examples of superior farming with their high-yielding crops growing on "completely, scientifically, affordably remineralized

and biologically reactivated soils." The humus shale, plus the soil remineralization completes soil environments which are spontaneously occupied by beneficial organisms. The remains of those beneficial organisms build up in such high tonnages so quickly that as the mass of remains "mineralizes," adequate nitrogen is released to meet the needs of any crop. (See Gravel Sources)

# A Major Correction from Last Issue

The article, ***Corn Grown with Biological Farming Methods*** on p. 39 of the previous issue was meant to show two photos as shown here. The caption is:

*Herb Ide, Waterloo, Iowa kneels to emphasize the difference in conventionally fertilized corn (left) and in the same field where 'complete, scientific, remineralization and spontaneous biological reactivation had taken place (right). (The person spreading the remineralizing and activating blend ran out of it.)*

# Book Reviews

## *The Dying of the Trees, The Pandemic in America's Forests*

Charles E. Little

Viking Penguin, 1995. 275 pp. $22.95

*by Joanna Campe*

This is one of the most significant and powerful books I have read in a long time. I looked at it a bit shortsightedly at first, because I had met the author at a conference in Washington a number of years ago and had sent him the magazine for a few years. I knew that he mentioned SR and wanted to see the reference to it. The reference is about three pages in a chapter called The Treesavers.

The author questions the feasibility of remineralizing vast tracts of the globe. He writes:

> *Acceptance of Hamaker's theory that a new ice age is imminent is not necessary for a sober analysis of the efficacy of rock dust used to improve the soils of forests like those atop Mount Mitchell, whose nutrients have been leached away by decades of acid precipitation. Therefore, the salient question for the treesaver is whether or not grinding gravel to dust and distributing it in the beset forests of the northern hemisphere is at all practical? On the most elementary basis, would the energy required to distribute rock dust produce more C02 than would be absorbed by the possible new growth that the applications would produce?*

He goes on to mention the development of a small grinder a few years ago called the Cyclone Pulverizer (unfortunately no longer produced), and that this could be a partial answer to the question. But he sees the idea as quixotic, at best.

In the current climate where environmentalists are seen as too negative and scientists are busy writing books telling us everything is all right and let's be optimists, this book strives to achieve a balanced view.

He points out that as Americans we want to see the problem and fix it, a kind of *can do* technofix attitude, which may in fact, get in the way of a deeper look at the situation to see if we are indeed on the right track of solving the problems and meeting the challenges we are faced with.

Whatever your attitude, from optimistic to apocalyptic, this book will invite you to look again, deeply and profoundly, to draw your conclusions carefully and take a fresh look, to become totally present to the reality that forests are dying everywhere. It is not a book written to empower you and make you feel good, that by doing such and such laid-out steps, we'll be doing the right thing. It doesn't make it easy. It calls forth our heart and soul to be aware of this issue. It is not painless. And it is very very important.

## *Soil Remineralisation and the Use of Rock Dusts: A Review of Literature and Current Practice*

Anna Collins

Henry Doubleday Research Association, Ryton-on-Dunsmore, Coventry CV8 3LG UK
January 1995, 24 pp.

*by Joanna Campe*

The review attempts to synthesize available information on SR as a result of numerous inquiries and the need to investigate the subject. It is a general overview with a survey of SR background, suitable rock types, benefits, nutrient release, applications and so on. There's a section on claims by individual users and scientific research. This is all well presented and objective. They conclude:

> *...the fact that successful results exist suggests that this is an area which would benefit from being investigated further. As Barrie Oldfield, for the Men of the Trees, says: "the time has come to pin down these garden legends and to bury the myths in good science"*
>
> *...having reviewed this subject it seems safe to assume that providing rock dusts are used in conjunction with other soil management practices that make for a healthy soil, benefits both in terms of more vigorous growth and improved mineral content of the plants may indeed be achieved.*

Once again, the main question and where doubts arise is concerning the feasibility of SR on a global scale. Collins writes in the conclusion:

> *There is little doubt that the application of igneous rock dust has positive effects on soil fertility, and that the effects are much needed. So far so good.*

They go on to suggest, that this measure to restore climatic balance seems flawed citing that it is a) perhaps wrong to view rock dust as a surplus and/or limitless natural resource and b) that once we get involved in transporting countless lorry loads of rock dust across and between countries the environmental sustainability of SR has to be questioned, and c) that the reasons why deforestation, soil erosion and desertification are happening are *complex issues* not given enough consideration in the Hamaker thesis. After all,

> *...there is a reason why the community of development workers, soil scientists, agronomists, economists, sociologists and politicians has been preoccupied with solving the problems of soil degradation for decades.*

In response to HDRA's conclusion, Cameron Thomson has come out with a small booklet, *Soil Remineralisation and It's Feasible Role in Stabilising the Climate Shift, A Comment on HDRA's Review.* For copies of the booklet write to him at the Earth Regeneration Centre, Scotston Farm, Auchterhouse, Dundee, DD3 0QT, Scotland.

# Letters and Forum

## INTERNATIONAL

### Chilean Hydrologist Interested in SR

On reading EPISODES, September 1994, I was informed about the possibility of obtaining some papers concerning SR. I work in hydrogeology at Servicio Nacional de Geologia y Mineria (the Chilean geological survey). Actually, we are involved in a program in our northern region, an arid zone, where SR techniques could help to restore agricultural soils highly degraded, by creating long term soil fertility.

**Arturo Hauser Yung**
Santiago, Chile

### Research Continues in Cameroon

Your contribution has been very profitable for the advancement of my works throughout this past year. I greatly wish this cooperation continues to exist between us.

**David Guimolaire Mwouathio**
Yaounde, Cameroon

### The Legendary Longevity of the People of Vilacamba

Reading ***RE*** #7-8 brought fond memories of friends I dearly admired. Dr. Bernard Jensen, I knew from California and personal visits to Vilcabamba to study the Old folk. Dr. William Peavy, with four degrees in agronomy, used to visit my humble trailer home behind Kaweah historic post office (near Three Rivers, California) where I raised a garden in humus I cleared off from a wild blackberry patch. Last, I must mention Margaret Wylie of Seattle, my art teacher at Kirkland Jr. and Sr. High School (page 69), now growing peas. So while these people mentioned have gotten me into writing another autobiography, let me get at it from the rock dust perspective.

My first experience pointing to the value of SR was at a road side fruit orchard at Valley Center, CA where a man grew a garden entirely of pulverized rock, mostly granite, with the least amount of humus I'd ever seen. He grew the most delicious and satisfying peaches, nectarines, and apricots I had ever eaten, after my five months visiting vegetarians, mystics, etc., in 1938.

I travelled to Florida, and worked as chore boy for Walter Siegmeister, who retailed colloidal minerals, rock dust, hardwood ashes, and sea kelp for SR. I performed experiments in the garden for him.

Later he followed me to Ecuador, and was shortly with me in Pujili, where farmers grew excellent potatoes sprinkling unfired natural limestone powder into rows, acre after acre.

I was living next to the Federal Penitentiary teaching English, where I saw tons of fine rock dust produced by stone-cutting convicts who squared rocks for building and paving, and I thought of those delicious peaches grown on pulverized rock, and how Julius Hensel explained SR in *Bread from Stones* which I had read at Siegmeister's in 1939. In 1945, the opportunity to put it in practice came. In Quilotoa, I used beach sand as a garden patch, digging trenches into which I buried alfalfa added with raw lime rock that pulverized easily, and grew the most mineralized cauliflower, and other raw salad vegetables without any diseases.

I came to the Loja region where I found people claiming ages of up to 150 years. So I re-established in Vilcabamba in 1962. The inhabitants explained their longevity as due to "using water beaten on rocks" which they got every morning at the river. "Beaten up" water was ionized water, and when the heavy rains came there was a deafening roar in the river with enormous rocks pulverizing themselves rolling down the steep Andes canyons, while the air was pungent with the smell of the ozone layer in the upper atmosphere being replenished. Like the Hunzas the crops the Loja natives raised were fertilized with mineralized silt, which replenish the ozone layer, chelate minerals, and upgrades the food and life of humans – in spite of their occasional alcoholism, tobacco, pork eating, etc., they live long happy lives. Again the Andes was world famous now as "The Sacred Valley of Longevity." Dr. Leaf from Harvard, Dr. Davies from London, from Heidelberg, Japan, and all over were not quite up on SR as a diet factor in longevity, attributing it to less significant factors.

I have told why our canyons naturally produce stone meal for our soil, plants, and centenarians. However, in rock quarries in every region of Ecuador, squared stones are made for buildings, etc., and crushed rock is made at gravel pits, or on site of cement building. I have hired children and women to pound gravel into desired crushed stone at Otavalo, Vilcabamba and here building Shambala Sanctuary, which makes rock dust. Otherwise, in composted vegetable boxes I pound stones into powder for remineralization. Primitive living saves us from the environmental pollution of gasoline crushers and transport. A stone mason's hammer does the best job. West of East Andes, at the foot of canyons like Vilcabamba, there is no Strontium 90 fallout, the soils are naturally mineralized, and there is good ozone protection, and remineralized food and people.

**Johnny Lovewisdom**
Loja, Ecuador

## In Scotland

There has been scientific interest in SR from the Scottish Agricultural College and the Macaulny Institute in regard to serious funding from the Millennium Commission, whose money comes from the national lottery. The Director of the Macaulay Institute, Prof. Jeff Maxwell, is looking into this question seriously with regard to getting the necessary support for a Regeneration Centre started in Scotland. I suggested the idea to him, and he responded. He was aware of reports suggesting that soils in Africa could be regenerated. Time will show whether these professional proposals will materialize, and if they do, a world centre for research into SR could be the outcome.

The research institutes in Scotland are large consultative and teaching institutes that have overseas clients, and are government assisted bodies.

I was very pleased to read in November's ***Scientific American*** the article by Wallace S. Broecker entitled *Chaotic Climate.* It now seems that the *The Survival of Civilization* thesis has become serious in mainstream science.

Work on land has been curtailed. The acid peat soils need a lot of sand to neutralize them for SR. I haven't had the results that Cameron and Moira Thompson have had on the other side of Scotland.

**Harold F. Lane**
Isle of Lewis, Western Isles, Scotland

## Tribute to Henry George

All honor to Leopold Kohr (Summer 1995 issue), but the real pioneer of "small is beautiful" economics is your own countryman, Henry George.

The gang youth empowerment program in South Central L.A. *(**RE** #7-8)* is splendid to read of, but truly to re-empower people there needs to be also a study of "Progress and Poverty" or "Social Problems" by Henry George – a linking up with Geonomists International (from "law of the Earth" i.e. Gaia) – learning the true law of Earth sharing. Land Rent For Revenue collected from every occupant every year. A perfect partnership with soil remineralization, both nurturing Gaia and setting her free.

**Shirley - Anne Hardy**
The Rocks, Scotland

# IN THE U.S.

## Argillite for High School project

Today we got some Argillite powder from a local quarry for Aaron's high school science experiment. Karl Zimmer, a member of the **Gardeners in Community** network, has applied the Argillite powder to his garden with "amazing results." So we got some for our Biointestive beds. Do you know any using Argillite powder?

Looking through my SR file, I just came across the article by Arthur and Catherine Summers in SR Spring '88. It inspired me to experiment using my Kombucha in place of the vinegar. I've been making/drinking/enjoying this fermented beverage since March. Now I'm going to infuse it with Heilerde (which I got from a friend in Switzerland several years ago but never used), according to Arthur's recommendation for gravel dust and vinegar. When I dowsed the Kombucha and Heilerde (clay) together my pendulum went wild! This is a rare phenomenon in my kitchen. Joanna, do you know anyone who is using the vinegar and rock dust together?

**Helene Huber**
***Gardeners In Community*** Newsletter, Salford, PA

*editor: I'm not familiar with anyone using argillite rock dust for trials and I look forward to the results of this high school science project. I don't know anyone currently using honey, vinegar and rock dust.*

## Initiating Orchard Remineralization

We operate a 250-acre orchard growing apples (95%) and raspberries. We are most interested in any information or research concerning fertilization of tree fruits, specifically apples. We presently spend time and money on a "standard" fertilization program, including attention to micronutrient status.

We started on an extensive orchard replanting program last year. Our new plantings include drip irrigation, with fertigation equipment as part of the irrigation system. The idea there is to spoon feed nutrients on small amounts at regular intervals. Since last year was the first for this approach, the jury's out on its efficacy.

There is one block of new plantings which may lend itself to an interesting experiment. We planted 2000 new trees there last year, including the above mentioned fertigation system. We will finish planting this new block this spring with 3000 new trees of the same varieties and on the same rootstocks. I would be most interested in using a rock dust approach on this year's plantings. We could then have a side by side comparison over the coming years. However, being totally ignorant on rock dust fertilization, we would need advice and guidance. Would we incorporate some sort of rock dust formulation in the ground before we plant? If so, how would we apply that formulation? Do we need to look at compost? Do we need to apply rock dust on an ongoing basis? If so, how much and when? Assuming there are many rock dust formulations, how do we decide what formulation to there are many rock dust formulations, how do we decide what formulation to use? Again, we are most interested in this approach.

**Allan Vignieri, President**
Sunset Orchard

*editor: I agree a new block of plantings is perfect for testing SR. Rock dust should be applied in the soil and mixed in from a few to several inches if possible before planting. Amount would be determined by the particular rock dust used. If compost is used, apply rock dust ideally during the composting process – otherwise rock dust and compost can be mixed and applied together. Applying rock dust periodically during the season as a spray to trees would be ideal. How often depends on particular orchard (seasonal insect infestations?) the particular tree crop and particular rock dust or formulation used.*

## Taconite Tailings in Agriculture

I am researching uses of taconite tailings for Hibbing Taconite Company which is located in Northern Minnesota. Taconite tailings are a pulverized mineral bearing rock which is

primary glacial gravel dust. The tailings are a by-product left over in a basin after magnetic iron has been removed. We produce approximately 8 million tons of a coarse graduation each year. My primary interest is the use of tailings to remineralize agricultural lands

**Thomas R. Trembath, Sr., Business Analyst**
Hibbing Taconite Company, Hibbing, MN

## Praise for *RE*

I want to let you know what a fabulous job you are doing with ***RE***. It's been a real education for me to read and re-read the past issue you sent me. Please accept my most heartfelt thanks for your dedication and work. I hope to give you some coverage shortly in my *Northland Berry News*. It's mostly a matter of finding the time to do justice to the soil remineralization issue and to ***RE***.

**Paul M. Otten, Editor-Publisher**
Northland Berry News, St. Paul. MN

## Reforestation with Rock Dust

I am a student in the Forestry Department at California Polytechnic State University in San Luis Obispo and will be doing some experiments using rock dust to improve tree seedling growth and survival for use in reforestation and afforestation projects. I really enjoyed reading your articles and I hope to one day find ***RE*** on the Internet so that more people can share in the message of SR. I look forward to learning more, please keep up the good work.

**Darien R. Nielson**
San Luis Obispo, California

## Seeds of Hope

Each issue of ***RE*** is an inspiration that just gets better and better. The last issue has an article "Hope L.A. Project: Planting the Seeds of Hope." If it works in L.A. perhaps it can work in Poughkeepsie which also has inner city problems. I will be circulating copies of this article to local officials.

I recently discovered two organic farms in Dutchess County, NY where I live, and will try to interest the owners in ***RE***. And I thank you for your special tribute to John Hamaker and how he changed your life. He certainly had an impact on mine that will remain a permanent influence.

**Bertram Cohen**
Poughkeepsie, NY

## Trying Out Fertimax

Dr. Supkow apparently did some tests from the 50# bag of Rico Verde he got late last spring – he ordered a 12-ton "pup" load of various "products" and has sent in a few New Jersey soil samples for Fertimax II analyses. (Their extreme levels of deficiencies are on par with the tropically leached soils of Costa Rica, where Dr. Barres' farm superintendent had already started replicated testing of Fertimax by the time Dr. Barres got there after the USDA conference. We've been "completely, scientifically and economically remineralizing and biologically reactivating" soils in Costa Rica for half a dozen years before the conference. Conventionally grown bananas, for example, were bringing only $5 a box – below cost of producing. Fertimax grown bananas bring $10 a box and return a high profit.

We overdid increasing sugar content in grapes: although picking started 31 days earlier than ever before (most have to wait "to get the sugar up") by mid-June Arizona table grapes were already becoming raisins – on the vines. The sap analyzing instruments had quit measuring when content hit 30% sugar. Keep up the crusade.

**Leland B. Taylor, Agronics, Inc.**
701 Madison NE, Albuquerque, NM 87110

## Natural Control for Nematodes

It is hard to believe that it's been over 5 months since I moved to Florida. My ag experiment went very well, in spite of adverse conditions that faced me, such as not having any soil and white sand loaded with nematodes. I studied up on the various pests here and found a great natural nematodecide – a fungus that parasitizes nematodes 25 different ways. I sprayed 2 tsp. per 1/2 acre and goodbye nematodes! I tested out all the theories I had in California regarding feeding soil microorganisms and I had a wonderful crop of 6- foot diameter size zucchinis, lots of different types of spinach, mustard greens, and of course, tomatoes.

Florida has had some record heat-breaking temperatures. Most of my neighbor's gardens have long gone to the compost state. But my high mineral-fed garden is doing well. It truly has been a great experience for me.

**Winston Kao**
Zephyrhills, FL

## Super Food Quality with NutriCarb

I work with a farmer who uses no chemical fertilizers or poison sprays. I later found out all he uses is his cow manure. When it was time to harvest vegetables, I was very disappointed. They were tasteless with poor color.

I've had a small organic business for 50 years and when I sold squash and corn, etc., from this new plot of land there were complaints. I had to make good on sales and explained substitutes. When I brought home some squash and corn home from there, they were extra large but even my chickens didn't come for them. The sweet corn was sweet but it didn't have a true corn taste. I realized the farmer used his cow manure that was deficient with little to no minerals.

I have used NutriCarb (the coal food) for many years and my garden produce is super quality. I'm very interested in minerals. I think the NutriCarb is as good as any.

**Cy Paul**
Prentice, Wisconsin

(*editor: Nutricarb is a coal-based product advertised in* Acres, USA)

## And They Thought He Was Crazy

I tried SR in 1950 on my Pennsylvania farm. It worked. It was my only topic of conversation but everyone thought I was crazy, so I shut up. Now, I'm retired and my place looks like paradise. My date palms and citrus trees are loaded with delicious fruit far superior to what you get in the supermarket. Still only a few people have gotten the

message... It may be too late for mankind to get the message as mother nature is about to get even – Big Time.

**Thor Friedemann**
Maricopa, Arizona

## Need a Grinder

No criticism, but still missing are practical suggestions for us folks out in the hinter lands on how to grind our stones. I want something to grind 2 - 300 lbs. up to maybe 1000 lbs. of good dust a year. Inexpensive and trouble free. I once had a set of plans (could have been Hamaker's) but they were impossible, difficult to understand. One can only imagine the backyard experimenting going on if this technology were made easily available. If someone could explain to me the way it's built and the materials used, I could build one.

**John Finley**
Box 3849, Kodiak, Alaska

## Land-based SR Not Enough

I liked the tribute to John. I had 3-4 letters from him in his last couple of years and considered myself privileged as I knew how hard it was for him to write. He always answered my questions, and pointed out things I had missed or not yet understood. I would have liked him to know that I have established a foundation as a result of his insight. I also liked the article by D.J. Supkow and have written to him for the whole article yours was excerpted from.

I support SR completely, although I see it as one necessary side of a two-pronged solution: Reducing global $CO_2$ content in the atmosphere, and 2) rebuilding and maintaining the ecological balance once that has been achieved to keep it that way. I just don't think that SR can occur fast enough or in a broad enough scope to effect the reduction of C02 in the atmosphere globally, in time. Fighting global warming involves much more than just remineralizing land-based plants. Three-quarters of the planet's biomass is water-based in the algae kingdom. Therefore I also support research on technological solutions for the reduction of atmospheric $CO_2$.

There is enough technology, money and willingness on this planet to handle the key issues. Evaluation of priorities, marketing and organization is what is lacking. Solutions built on the whole picture are needed. Major programs are based on scientific evidence that can be used to get funding. One of the purposes of S.E.E. Foundation is to provide funding for such projects and programs. Last year I wrote an article for Space Energy Journal entitled *Climate Stabilization – Carbon Summary*. It was recently translated into Russian and will appear in the Russian edition of *Nature* magazine.

**Jarrett Buys, Safeguard Earth's Environment**
1239 S. Greenwood Avenue, Suite 301
Clearwater, FL 34616

Note for ad below:
**Mineral Rite** at this time is only available in North Carolina and Virginia by the truckload. They will be bagging the dust for sale in the near future.

MINERAL RITE™
A Soil Amendment Material
100% NATURAL
ROCK DUST & ROCK PARTICLES

MINERAL RITE™ Benefits:
- 100% natural
- Soil conditioning
- Amends soil texture
- Environmentally safe
- Improves soil structure
- Soil amending
- Non-polluting
- Improves soil porosity
- No added (man made) chemicals

MINERAL RITE™ Can Promote:
- Waterholding capacity of soil
- Beneficial soil bacteria
- Earthworm population

Vulcan Materials Company
The World's Largest Producer of Crushed Stone
P.O. Box 4239 • 4401 North Patterson Avenue
Winston Salem, NC 27115
1-800-477-7625
(fax) 910-744-2018

# Energy and Remineralization

## From Switzerland

Thanks for the last issue of ***RE***. I noticed you mentioned the death of Dr. Gernot Graefe. A very big loss.

My personal news is that we don't really understand what counts fertility even though we may know what destroys it. I think there is more to it than soil properties. Something like fields. (Sheldrake describes them as morphogenetic fields acting through time and space). We cannot measure them by physio-chemical means. Life is really the only instrument reacting to them.

**Dr. Pierre Lehmann, Physicist**
Vevey, Switzerland

## Proving Energetics Scientifically

Thanks for publishing my article. I, too, believe in energetics but my role is to scientifically prove it. I'll be speaking at the 1996 Annual Convention at the Wisconsin Natural Food and Associates.

**Dr. William Peavy**
Alburquerque, New Mexico

## K-IDA-AG is Truly Unique Energetically

I'd like to talk about why I think K-IDA-AG is different. I get products from all over the western U.S. and each varies as to how it is put in the formulation. Every mineral has an energy signature and this in turn has a bearing as to how well things work. Even the different rock powders have a different signature. I put a variety of products together into one. In testing last summer we tested two formulations that I had. The first formulation, which I thought would take 60 days to change the ground from a negative to a positive, took 59 days. A new formulation that I thought would take 21 days took 21 days. However we added one thing to it and it went down to two days. I think that if I can find the products that I know I need, I can do even better.

What this means is that the chemicals will have no more effects on the plants, even when we raise them on full chemical farming programs. With this process it will make food better than most food on the market to day, including *organic*. This statement is based on the fact that my food has been tested by people with the equipment that can compare them and they have not found any that is better.

There are many articles out there that tell what is wrong with the food that we have to eat. I believe that I have a product that is viable in this area to make food better. Life Force is the measure of health, vitality and energy of all living things. It is not measured in the chemical sense, but has to be measured differently. Food raised with this higher life force will make us the healthiest that we can be. Life force has been declining for quite sometime, and the ability of our food to keep us well.

Food is our first line of defense, herbs and other natural products the next. Doing these things we should have less need for the Medical establishment. We then can take control of our lives. Our health and quality of life will improve dramatically. Food raised with the products that I have may not test higher in minerals and nutrients on a chemical test, but the minerals and nutrients will be more available and have more life.

**Ken Hahn, K-IDA-AG**
2540 Smith Road, American Falls, ID 83211
(208) 226-5884, 1-800-727-5884 (outside Idaho)

## Yin, Yang and the PCSM meter

I feel that I have complicated the subject of rock powders enough already without adding more complications but I could add more complications if you and your readers can stand them.

I. The PCSM meter manufactured by the Pike Laboratories measures actual paramagnetism found in such rocks as basalt, greenstone, and granites. But it does not measure the YIN and YANG of many other rock powders which are not paramagnetic but do have life like qualities which can be picked up by dowsing. In other words, there are at least three different classes of rock powders:

1) Paramagnetic: measurable with scientific instruments
2) Enlivened: not measurable with scientific instruments but can be dowsed with either YIN or YANG qualities
3) All others

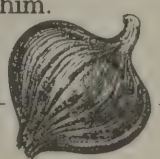
II. John Hamaker and Don Weaver have preached on remineralizing the earth with rock powders. But what happens if there is a pole shift and many lands now beneath the sea rise above the sea and many lands above the sea sink beneath the sea? That is REAL remineralization of the Earth. There are strong indications that that is going to happen in the not too far future. If it does indeed happen, it will be within your lifetime.

**Harvey Lisle**
Norwalk, Ohio

*editor: A possibility which shouldn't deter us from the task of restoring the Earth.*

## Paramagnetic-ELF Force

I worked hard in reading all I got my hands on and continued to put it all to work in the soil. I am happy and proud to say my soil measures 571 GAUSS of paramagnetic energies measured on Phil Callahan's new PCSM meter put out by Pike Lab Supplies, Inc. in Strong, Maine, (207-684-5131; FAX -5133). Phil's new book, *The Paramagnetic - ELF Force, How to Farm Properly as God Intended*, will be out as soon as he gets more meters available. Mr. Pike was telling me it's taking time to adjust each unit perfectly so the meter doesn't read diamagnetics on paramagnetic sources. "They" are searching for a base rock high (over 2000) in paramagnetic energies especially in Oregon thus far. I encourage myself a great deal when I found I was telling Mr. Pike a few things I learned in my research that he didn't know, but helped and encouraged him.



**Frances Lanseros**
Centreville, Alabama

# The Network

***A Grapevine For Subscribers–***
**to network and communicate with each other about SR**

**Robert Able**
P.O. Box 400
Collins, NY 14034
716-532-3372
Gernatt Gravel glacial dust (see ad)

**Dr. John Alloway**
9927 Brixton Lane
Bethesda, MD 20817
1-800-872-6535
Holistic Chiropractic physician using herbs, aromatherapy, nutrition, exercise physiotherapy, electronic acupuncture, and shamanic counseling.

**O.C. Barker**
**BAR-RIO Organic Farms**
2186 Ralph Winstead Road
Leasburg, NC 27291
910-597-3923
We grow and process medicinal herbs

**Michael and Lisa Biskup**
Apartado 937-8000
San Isidro de el General
Costa Rica
Interested in raw food diet/health/SR/reforestation and farming in the tropics. We will begin farming 30 acres in the Southwest part of Costa Rica and would like to interact with others who are interested in the same topic and/or have experience in this area. Opportunities for community building – feel free to write us.

**Lester Black**
84 2 Corrine, Lot 12
San Antonio, TX 78218-1700
(210) 826-5725

**Steven Joshua Blue**
429 S. Alu Rd
Wailuku, HI 96793
(808) 249-0601

**Jeffrey Bruno**
1 Carmel #2
Pacifica, CA 94044
(415) 738-0807
Nutritional psychologist. Father. Wild algae – the world's most perfect food. Cell Tech. Double Diamond Executive. Healing Arts.

**Omar Dix**
34 Franklin
River Forest, IL 60305
(708) 771-5602

**Eddie Filer**
7150 Lilac Lane
Naples, FL 33964-2428
(941) 657-6541
I use rock dust in compost. I would like to meet other organic gardeners in my area.

**Timothy C. Foust**
299733 320th St.
Bellevue, IA 52031
(319) 773-2789
Representative for Planters Trace Minerals and organic farmer

**Thor Friedemann**
52546 W. Esch Trail
Maricopa, AZ 85239
My well water has too many minerals. How do organic gardeners deal with this problem?

**Gaia Farms**
P.O. Box 444
Camp Sherman, OR 97730
(503) 595-1000

**Glaser Farms**
19100 SW 137 AVE 1
Miami, FL 33177
(305) 238-7747
We are an organic tropical fruit farm south of Miami. We only use inputs which are nutritive and have been using rock powders and seawater.

**Joyce Gayheart**
Rt 2 Box 274
Cold Spring, NY 10516
(914) 265-9628

**Doug Gunnink**
Rt.1 Box 105
Gaylord, MN 55334
507-237-5162
Consultant for sustainable/organic farmers using many rock dusts, and getting great results with taconite.

**Bill and Doris Isely**
80 Walnut Creek Road
Franklin, NC 28734
(704) 369-7590
Organic, mini farming. Unusual food supplements distributor and vegetarian.

**L.C Jones**
4818 Greenspring Ave.
Baltimore, MD 21209
Interested in availability of rock dust products in my area, their quality ratings, and "success" findings realized by users.

**Winston Kao**
1884 McKinley
Clearwater, FL 34625
(813) 447-2344
The Carefree Water Conditioner with venturi effect core scrubs the water as rocks scrub water in a mountain stream, and earth grounding provides free electrons. This brings you "Live or Living Water." The resultant water is wetter water, that has better penetration and better absorption.

**Gene Kelly**
2 Hamamaula Street
Honolulu, HI 96825
(808) 395-1630

**Koh Koh Keng**
Blk 508 West Coast Drive #06-257
Singapore 120508
e-mail: kokkeng@singnet.com. sg

**Andrew R. Kozlowski**
54 Canadian Avenue
London, SE6 3BP England

**Craig Lanoye**
13 Fath Dr. Apt. #4
Cheektowaga, NY 14225
(716)681-4423

**Meridian Aggregates**
**Dan Bokinskie**
P.O. Box 69
St. Cloud, MN 56302
(612) 251-7141

**Paul Moore**
2904 Marlow Road
Silver Spring, MD 20904
(301) 890-4159

**Joseph B. Newcomer**
2090 E. Lilac Lane
Decatur, GA 30032
I am interested in the best fig tree varieties for the southeastern states.

**Alex and Ilka Nicolson**
1305 N. Columbus #109
Glendale, CA 91202
(818) 507-6086
I am a mechanical engineer by training with a strong interest in soils, water and air quality. Currently doing research on water structures and their ability to convey biological messages. I am also involved in ozone layer research and the influence of CFC's.

**McInnes**
**Natural Fertilizers**
120 Railroad
Rock Island, Quebec Canada
100% natural fertilizers and soil amendments (rock dusts).

**Emily Noble**
6102 Carvell Ave.
Indianaplis, IN 46220-2075
(317) 259-4578

**Richard C. Ruschman**
5949 Sherry Lane #1135
Dallas, TX 75225
(214) 739-2863
I am a commercial real estate and business lawyer.

**Safeguard the Earth's**
**Environment Foundation**
Jarrett Buys, President
1239 S. Greenwood Ave
Suite 301
Clearwater, FL 34616
(813) 443-4731
Non-profit, purpose to prioritize environmental situations, educate various publics as to these global issues and their solutions, advocates need for technological solutions as well as SR.

**N. Manfred Shaffer**
**Wilder Ranch Campground**
1800 Coast Road
Santa Cruz, CA 95060-5618
(408) 423-2333

**Ron Sontag**
116 Alexander Avenue
Scotia, NY 12302
I am fascinated by plant mechanisms and repelled by chemical fertilizers. I have begun using spiral rock dust with no decided effects, but I remain highly optimistic of success.

**Jason Andrew Stock**
1708 Chula Vista
Belmont, CA 94002
415-595-1411
Cheektowaga, NY 14225
(716) 681-4423
Welcoming correspondence and advice. Interested in all things sustainable and organic. Currently a CSA member for an intentional community and voluntary simple life style.

**Joyce and Bill Whipple**
**DBA Golden River Farm**
**Organic Produce**
P.O. Box 73568
Fairbanks, AK 99707
(907) 456-5876
Certified seed potatoes,
Vegetable and flower grower.


## PROD Permaculture Review, Overview and Digest

*The new publication gleans critical permaculture from scores of publications and books to provide an information-packed digest. Published in a newsletter format, PROD includes digests of articles and other information sources, book reviews, magazines and organizations and overviews of themes suggested by the materials in a particular issue. Subscription US $18.00 postpaid worldwide for 4 issues.*

*Sample issues are US $5 postpaid. Yankee Permaculture, P.O. Box 672, Dahlonega GA 30533-0672.*

## Catalyst

*A point of contact for Psychic Connections and Networking*

Catalyst is the New Age Directory Limited Edition of the most extensive, unique resource of NEW AGE/METAPHYSICAL networking newsletters, publications, book reports and unique products from U.S. and overseas. **Large Personals resource section, Natural Health Information, UFO's.**

$7.95 & $2.00 Postage and Handling. Send to P.O. Box 670022, Marietta, GA, 30066. (Back editions of newsletters (4) $2.00 each. (Overseas add $5.00 P & H direct.) Written up in 1987 OMNI MAGAZINE, EDGAR CAYCE and hundreds of other newsletters. This Directory will keep you happy for years!!

## Turtle EyeLand

featuring the writings of

## David Yarrow

Natural Healing
Soil Remineralization
Native Permaculture
Sustainable Food Systems
Dowsing
Sacred Space
Earth Mysteries
Geomancy

order from:
*David Yarrow*
*c/o Broekx, P.O. Box 6034, Albany, NY 12206*
tel: 518-426-0563 email: dyarrow@ apc.igc.org

## Worm Digest

Box 544 • Eugene, Oregon 97440-9998

*Worms Deepening Our Connection to Food and Soil*

**A quarterly newspaper reporting on worms and vermicomposting world-wide.**

**Networking people, information and resources.**

Subscriptions: U.S. $8/yr • Can/Mex $11 • Other $16

# Gravel and Rock Dust Sources

## *FOR AGRICULTURE AND FORESTS IN THE U.S.*

### NORTHEAST

**Gardener's Supply**
Tod Whitaker
128 Intervale Rd.
Burlington, VT 05401
(800) 955-3370
Ask for Trace Minerals.

**Gernatt Gravel Products, Inc.**
Robert J. Able
Richardson and Taylor Hollow Road
P.O. Box 400
Collins, NY 14034
(716) 532-3371

**John Kurtz**
358 Kurtz Road
Ephrata, PA 17522
(717)354-0426
Basalt diabase, #300 mesh, delivery in Lancaster area at $8-9.00/ton.

**Laurence Lynch Co.**
Glenn Burbank
396 Gifford St.
Falmouth, MA 02540
(508) 548-1800
Native stone

**Maine Seaweed Co.**
P.O. Box 57
Steuben, ME 04680
(207) 564-2875
Sea vegetables and garden fertilizer.

**Moose Growers Supply**
P.O. Box 520-RE
Waterville ME 04903
(207) 873-7333
Azomite and others

**The Notch (Lane and Son)**
Rte 116
Amherst, MA 01002
(413) 253-2075
Very fine traprock (3-400 mesh) basalt dust.

**Lane and Son**
Attn: Floyd
311 East Mt. Road
Westfield, MA
(413) 562-3694
Traprock and a silt and gravel mix.
(413) 498-2956

**Lane Construction Corp.**
Jim Merold
P.O. Drawer C
Northfield, MA 01360
Glacial till, 54% through 200 mesh.

**Snow Pond Farm Supply**
RR 2 Box 1009
Belgrade, ME 04917
(800) 768 9998
Azomite and Clod Buster

**Tilcon Inc.**
Joseph A. Abate
P.O. Box 1357
New Britain, CT 06050

**Tilcon Capaldi Inc.**
718 Grand Army Highway
Swansea, MA
02777-4590
(508)677-3300

**Tilcon Maine Inc.**
Route 9
P.O. Box 1030
Wells, ME 04090
(207)676-9973

**Tilcon Gammino**
875 Phenix Avenue
Cranston, RI 02921
(401)942-730

**Tilcon Delaware Inc.**
73 Horsepond Road
Dover, DE 19901
or, P.O. Box 858
Dover, DE 19903
(302)678-8414 Admin.
(302)735-9950 Op/Sales

**Tilcon Connecticut Inc.**
909 Foxon Road
P.O. Box 67
North Branford, CT
06471
(203)484-2881

**Tilcon Mass., Inc.**
Attn: Tim Kelly
72 Main St. P.O. Box 114
Acushnet, MA 02743

**Tilcon New Jersey Inc.**
P.O. Box 8248
Haledon, NJ 07508
or, End of Planten Avenue
Prospect Park, NJ 07508
(201)942-4400

**Tilcon New York Inc.**
66 Long Clove Road
Congers, NY 10920
or, P.O. Box 362
Haverstraw, NY 10927
(914) 638-1300

**Tilcon-Arthur Whitcomb**
W. Lebanon, NH 03431
(603) 352-0101
Greenstone-meta basalt – They have many sites in NH and VT. Call for info.

**Tilcon Roncari Inc.**
60 South Main Street
P.O. Box 1776
East Granby, CT 06026
(203)653-2524

**Roylance Environments**
Distributor Planters II Trace Mineral Fertilizer
Judy Roylance
Rt. 1 Box 1398
Dogwood St.
Sag Harbor, NY 11963
(516) 725-1009

**Kingston Traprock Co.**
Dept. 1
Kingston, NJ 08528
Dia-King diabase rock powder. Write for info.

**Flora-Stim**
Strite's Warehouse
P.O. Box 128
Greencastle, PA 17225
(717) 597-3325

### SOUTHEAST

**Davidson Mineral Properties**
Gene Rice, Inside Sales
P.O. Box 468
Lithonia, GA 30058
(404) 482-7231
The granite quarry which formerly carried the product Hybro-tite. Ask for M10 sand.

**Fairglen Farms**
Jim Glen
570 Brevard Rd.
Asheville, NC 28806
Planters II.

**Mineral Rite**
P.O. Box 4239
Winston Salem, NC
27115
1-800-477-7625
fax 910-744-2018
See ad page 46. For VA and NC only. Not bagged yet, but will be soon.

### MIDWEST

**Brookside Farms Lab**
Director Mark Flock
308 S. Main St.
New Knoxville, OH
45871, 419-753-2448
For mineral analysis and other soil analyses

**Min Plus U.S.A.**
Omar Khalil Miqdadi
P.O.Box 574
Fariibault, Minnesota
55021 USA
Tel: 1-507-332-0518
fax:1-507-332-0782
Shipping to several states

## *INTERNATIONAL*

**Community Builders**
**Wm Hurrle**
1494 Cedar St.
Green Bay, WI 54302-1856
(414) 432-2882
fax (414) 432-1705
Planters II distributer.

**Falls Last Flower and Drum Song Garden**
Box 13
Scotland, AR 72141
Planters II

**Timothy C. Foust**
29733 320th St.
Bellevue, IA 52031
(319)773-2789
Representative for Planters Trace Minerals

**Mt. Ark Trading Co.**
120 South East Ave.
Fayetteville, AR 72701
1-800-643-8909
Sell Planters II & ELX.

## WEST

**Agronics, Inc.**
**Col. Leland Taylor**
701 Madison St N.E.
Alberquerque, NM 87110
(505) 298-1748
Fertimax, Clodbuster and other products

**Bio-Essence Research**
Todd Franz
4004 Villa Court
Fair Oaks, CA 95628
(glacial stonemeal)

**Henry Bruski**
P.O. Box 2104
Cupertino CA 95015
rock dust and seed company specializing in remineralized seeds.

**Common Ground Ecology Action for Organic Gardens**
2225 El Camino
Palo Alto, CA
415-328-6752

**Michigan Aggregates**
996 East Chicago Rd.
Jerome, MI 49249
(517) 688-4414

**Grab "N" Grow**
2759 Llano Rd.
Santa Rosa, CA 95407
(707) 575-7275

**K-IDA-AG**
Ken Hahn
2540 Smith Road
American Falls, ID 83211
(208) 226-5884, 1-800-727-5884 (outside Idaho)
A unique and energized formulation of minerals.

**Mosaic Soil Co.**
Howard Elmer
11666 Gateway Blvd.
Dept. MF1
Los Angeles, CA
90064-2829
(310) 285-7870
Supplier for different regions. Looking for distributors. Please inquire.

**Peaceful Valley Farm Supply**
P.O. Box 2209
Grass Valley, CA 95945
(916) 272-4769
Azomite, Soil-Min

**Pacific Organics, Inc.**
Rob Gould, President
P.O. Box 12786
Salem, OR 97309-0786
Organic fertilizer blends using rock powders and compost.

**Peak Minerals – Azomite**
205 Eagle Point Drive
Branson, MO 65616
Tel: (417) 336-6666
Fax (417) 336-6630

**U.S. Soil**
Planters II and ELX
P.O. Box 926
Salida, CO 81201
(800) 254-1306
For larger shipments and 5 lb packages.

## NORTHWEST

**Egge Sand and Gravel**
90520 Coburg Rd.
Eugene OR 97408-9467
503-485-1515
Contact Jeff

**Gaia Resources**
Michael Dean
Box 215
Danville, WA 99121
For all U.S.

**Roger and Gayle Kahane**
7260 London Rd.
Cottage Grove, OR 97424
(503) 942-DUST

**Remineralization Products Inc.**
McKenzie RockFlour
Lee Poindexter
P.O. Box 70183
Eugene , OR 97401
(503) 344-2524

## CANADA

**Gaia Resources**
Michael Dean
P.O. Box 2199
Grand Forks, BC
V0H 1H0, Canada
(604) 442-3745

**McInnes Natural Fertilizers Inc.**
Box 377
St. Bruno, Quebec
J3V 5G8 Canada
Tel: (514) 441-16625
Fax (514) 653-0342
Basalt rock dust and Mica available in various fertilizer mixtures.

## AUSTRALIA

**Agreocology Associates**
Larry Geno
P.O. Box 149
Lismore NSW 2480
Tel: (066) 89 5374
Independent consulting assistance in: Organic & Sustainable Agriculture, Organic Product Certification, On-Farm Advice & Conversion Plans, Organic Food Processing & Marketing

**Natural Mineral Fertilizer**
Norm Todkill
21 Blackwood Ave.
Morningside 4170
Brisbane NSW
Tel: 07 399-1230

**Organic Nature Products**
Neo-Min
261 Kingsway Rd.
Landsdale 6065 or
P.O. Box 1380
Wangara 6065
Tel: 250-2059
Fax 343-3899

**Pacific Mineral Development Ltd.**
Min-Plus
Sam Catalano
P.O. Box 594
Innisfail
North Queensland
4860 Australia
Tel: 070-644118

**Sustainable Agriculture and Food Enterprises**
3/42 Junction Rd.
Burleigh Junction
Qld. 4220
Tel: (075) 93 4566
Fax (075) 93 4877

# EUROPE

## AUSTRIA

**Basaltwerk Pauliberg**
A-7341 Markt St. Martin
Tel: 0043-2618-25513

**Bioglück**
A-3950 Wielands
Tel: 02852 2414

**Diabaswerk Saalfelden**
**H. Stephan & Co.**
A-5760 Saalfelden
Tel: 0043-6582/2373-74

**Firma Diwoky**
Frachtenbahnhof Gersthof
A-1180 Vienna
Tel. 472241

**Firma Gleichenteil**
Gleichentheilgasse
A-1230 Vienna
Tel. 672193, 672194

**Gebr. Schlarbaum**
A-8330 Mühldorf
Post Feldbach

**Kärnter Basalt**
Kampach, St. Paul
Lavanthal

**Klöcher Basaltwerke**
**Stürgkh & Co.**
A-8493 Klöch
Tel. 0043-3475/292, 411

**Konrad Planegger**
**Diabas Werk**
A-9134 Launsdorf
Tel. 04213 2044

**Sanvita**
**Hartsteinwerk Kitzbühel**
z.H. Ing. Franz Cervenka
Postfach 44
A-6370 Kitzbühel
Tel. 0043-5356/4333

**Robert Schindele**
**Furnierwerk**
**Superbiomin**
Kicking 18
A-3122 Gansbach

**Wolfram Bergbau- u.**
**Hüttengeselschaft mbH.**
A-8542 St. Peter i.S.
Tel. 0043-3465-2101

## DENMARK

**Greenworld**
**Export/Import**
Werner Meier Jensen
St. Blichersgade 21. G.
DK – 8900 Randers
Tel. 45-86-41-49-56

## ENGLAND

List of 80 quarries in U.K.
**Redland Aggregates Ltd.**
David Langley
Technical Manager
Bradgate House, Groby
Leics. LE6 0FA

**College of Soil Research**
**Eileen Moore**
5 Chase Side Place, Enfield
Middx. EN2 6QA
tel. 01 363 8615
Several kinds of rock dust and **Superbiomin** mineral powder for internal use.


**Acres, U.S.A.**

*A monthly journal dealing with biological agriculture.*

*The emphasis is on production of quality food without the use of toxic chemicals.*

*Samples are $2.50*
*Subscriptions U.S. $20/year*
*Foreign, U.S. $23/year*

*P.O. Box 8800, Metairie LA 70011*
*(504) 889-2100*


**Cumulus Organics**
Two Mile Lane
Highham, Glos.
GL2 8DW
Tel. 0452-305814
Ground volcanic dust.

## FRANCE

**Societe de Carrieros**
**de St. Nabor**
67530 Ottrot
St. Nabor, tel 88958114

## GERMANY

**Basaltwerk A. Melato**
Postfach 105
34560 Fritzlar 1
Tel. 05662/2961

**Basalt Vertriebgesellschaft**
Südniedersachsen
Bramburg,
D-3404 Adelebsen

**Basaltwerk Wiesau/Opf.**
250 Maclellan Bldg.
Triebendorf

**Firma Ernst Otto Cohrs**
**Lava-Union**
D-5485 Sinzig/Rhein
Kölner Str.22
Tel. 02642-4010

**Franz Carl Nüdling**
**Basaltwerke**
Ruprechtstr. 24
36037 Fulda
Tel. 08586/71071-72

**Granitwerke Georg Kusser**
Postfach 31
94078 Freyung
Tel. 08586-1242

**Hauri KG**
Sonnhalde 6
79268 Bötzingen
Tel. 07663-1051, 1052

**Hermann Wegener**
**BBasaltwerke**
Postfach 6499
30064 Hannover 1
Tel. 0511-326321

**Kasseler Basaltwerke**
63683 Ortenberg 1
Tel. 06046-7991

**L. Geiss KG/Birkerfelder**
**Hartsteinwerke**
55765 Birkenfeld

**Lava-Union GmBH**
Postfach 1110
53475 Sinzig
Tel. 02642-401-0

**Nordhessische**
**Basalt-Union**
Fünffensterstr. 4
34117 Kassel
Tel. 0561-18321, 13885

**Porphyrwerke Weinheim**
Shriesheim AG
Postfach 1609
D06900 Weinheim

**Schotterwerk**
D-7613 Hausach/ Hechtsberg

**Spörl KG**
Postfach 25
95173 Schönwald
Tel. 09293-575-5788,
09251-6197

**Steinbruchbetrieb**
**Zeilberg**
Postfach 1340
95662 Mitterteich

**Valentin Busch KG**
Postfach 28
92250 Schnaittenbach
Tel. 09622-1761

**W. Maurer oHG**
**Basaltwerk**
95676 Wiesau/Opf.

**Xaver Schwendenmann**
77796 Mühlenbach
Tel. 07832-2066

## SWITZERLAND

**Bertrand Rime**
1751 Middes
Fribourg
Tel. 037 681335

**Bioticino**
V. Gautschin, V C Molo 1
6500 Bellinzona, Tessen
Tel. 092 262 984

**Firma Otto Gamma AG**
Seestrasse 336
8038 Zurich
Tel. 02 832765

**Johann Wenger**
Muller Poffetmuhle
1717 St. Ursen
Fribourg
Tel. 037441173

**Maurice Schillinger**
Garten Center, Rte Suisse
1196 Glant, Vaud
Tel. 022 642267

**Wytor SA**
1628 Vuadens, Fribourg
Tel. 029 28280

**Zimmerli**
**Mineralwerk AG**
Hohlstrasse 500
CH-8048 Zürich
Tel. 0041-1/641040

## *Mineral Health Supplements*

**Naturopathic Formulations, Inc.**
P.O. Box 7594
North Port, FL 34287
1-800-326-5772
Fax: 813-426-6871
Trace-Lyte, Cal-Lyte, Skin-Lyte and other electrolyte mineral products.

**Super Blue Green** algae comes from a remineralized glacier-fed lake; from Cell Tech Inc., Klamath Falls, 1-800-321-1303.

**Klamath Blue Green Inc.** algae based in Mt. Shasta, CA.
1-800-327-1956.

**KM** mineral supplement based on plant sources, esp. high in potassium. Matol 1-800-237-7002.

**Boddy Toddy**
Rockland Corporation
Tulsa, OK 74128
(918) 437-7310
(800) 331-3659

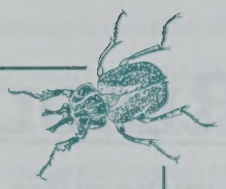
See **Maine Seaweed,** Northeast Listing.

**Pascalite, Inc.**
P.O. Box 104
Worland, WY 82401
307-347-3872
Calcium Bentonite clay
1-800-321-1303.

**The Grain and Salt Society**
P.O. Box DD
Magalia CA 95954
tel. 916-872-5800
fax: 916-872-5524
Light grey unrefined seasalt complete with all elements and trace minerals.

**NuLife Minerals, C&M Laboratories International, Inc.**
807 Kincaid Road
Williams, OR 97544
1-800-333-1160
Fax (541) 846-8961
Clark's Original Mineral Formula, a nutritional supplement of highly concentrated minerals and trace minerals.

## *Insect Balance*



**SilKaBen**
Prevents fungus and deters sucking and chewing insects. Item no. 5-224. Call Gardener's Supply, 1-802-863-1700.

## *Safety Masks*

Action Mining Services Inc.
1-800-624-151.
A mask should be used if applying dry rock dust to avoid inhalation, depending on the fineness of the gravel and wind conditions.

## *Finding Local Sources of Rock Dust*

Contact your local state aggregate association. For a copy of a complete list of state associations send a self addressed stamped envelope and $1.00 to ***Remineralize the Earth.***

## *Mineral Analysis*

**Elemental Research, Inc.,**
Robert Brown, President
309-267 West Esplanade,
North Vancouver, B.C.
Canada V7M 1A5
Spectroanalysis of rock dust.
Tel. (604) 986-0445
Fax (604) 986-0071

**Cantest,** another company in Canada which analyzes samples of rock and gravel dust. Tel. (604) 734-7276

## Australasian Health and Healing

**Australia's Journal of Alternative Medicine**

Edited by
Dr. Maurice Finkel

Dr. Finkel does diagnostic analysis using dowsing. For your complimentary analysis of an organ of your choice, send a photo and SASE to address below.

Subscription to **Australian Health & Healing** is (Australian currency) $27.90 per year or $29.90 with an 8-page Newsletter.
Please fill out details and send together with your cheque or Money Order to:

**Australasian Health and Healing**
P.O. Box 206
Kingscliff NSW 2487

Name----------

Address----------

---

----------P/Code----------

# RESOURCES

## *Remineralize the Earth* magazines

***Remineralize the Earth*** issue # 9 is available in bulk for conferences and networking to current subscribers only.

- 10 or more copies at $2.00 each

***Remineralize the Earth*** double issue 7-8 is now available in larger quantities at a special price *to current subscribers* for networking:

- 2-9 copies at $4.00 each
- 10 or more copies at $3.00 each

Discounted for book and health food stores. Please contact us for prices. Some past issues are available for $3.00, though many are out of print.

## SR Research Packets

### Soil Remineralization Agriculture Packet 1996

SR research around the world for agriculture and orchards. Spiral bound, 146 pp.

### SR Forestry and Sewage Treatment Research Packet 1996

Spiral bound, 82 pages. See Price List on page 56.

### Video – USDA Forum on SR and Sustainable Agriculture

A four-tape set of the Forum on Soil Remineralization and Sustainable Agriculture, which took place May, 1995 at the USDA headquarters in Beltsville, Maryland is available for $65.00

### Don Weaver Supplement

*Solar or Ice Age? Further Insight and Perspective on Global Climate Change* and *More Interglacial-to-Glacial Weather Extremes*. Spiral bound, 20 page. See page 55 to order this special supplement from ***RE.***

## Hamaker Weaver Publishers

### The Survival of Civilization

By John Hamaker and Don Weaver ($12.00 ppd.). This important book is the foundation on which SR and the grass roots movement rests.

### The Solar or Ice Age? Bulletin

(366 pp.). Don Weaver has put together current events supporting climate change from the coming Ice Age perspective, including recent volcanic and tectonic activity, what's happening to forests, and weather as well as global networking of SR news. (1989) Suggested minimum donation $10.00.

Don Weaver, Hamaker-Weaver Publishers, P.O. Box 1961, Burlingame, CA 94010. Tel (415) 347-9693. *The Survival of Civilization* ($12.00 ppd.) can also be ordered from Anita Hamaker, Hamaker-Weaver Publishers, Rte. 1 Box 1490, Seymour, MO 65746. (417) 935-2116.

Common Wealth Printing Co. Inc.
47 East Street, Hadley, MA 01035 • 413-584-2536
A worker-owned and operated, unionized press.
✦ in-house desktop & design services ✦ file transfers
✦ high quality offset printing
✦ large selection of recycled papers ✦ soy inks
Flyers • Newsletters • Posters • Books • Catalogs

## Video

### Stopping The Coming Ice Age

Complete 57-minute version by the late Larry Ephron currently available from Lynne Ephron Sarafian, 406 1/2 Laurel Ave., Menlo Park, CA 94025. Tel. (415) 323-4034. The cost is $33.95, plus $3.50 for shipping and handling within the U.S.

The video is also available from *The Video Project, Films and Videos for a Safe and Sustainable World, Catalog 1993,* in an edited 45-minute version for $29.95. Call 1-800-4-Planet.

## Earth Regeneration Society

An active and effectively organized network, stimulating and coordinating initiatives in scientific research and both governmental and non-governmental policy. They have available numerous scientific papers on climate for implementation of an Earth Regeneration Program. Alden Bryant, President with Fred Wood Sr., Ph.D. and others. Earth Regeneration Society, 1442A Walnut St. #57, Berkeley, CA 94709. (510) 525-4877 or Fax (510) 559-8410.

## Recommended Reading

### Bread From Stones

The book by Dr. Julius Hensel and his pioneer writings from the 1890s on stone flour for agriculture, is now available from the ***Acres U.S.A.*** mail order bookstore. In addition to the classic text, *Acres U.S.A.,* has included comments by John Hamaker, among others. Softcover, 102 pages. Order No. 4024. Send $11 in U.S. and $12.00 outside U.S. postpaid). *Acres USA,* P.O. Box 9547, Kansas City, MO 64133.

### Secrets of the Soil

This book by Peter Tompkins and Christopher Bird is a sequel to the now classic ***Secret Life of Plants.*** There are four chapters on remineralization. A fascinating account of recent breakthroughs – scientific and spiritual – that can save your garden or farm. This book is available, or can be ordered at your local bookstore. It is published by Harper and Row.

## *Remineralize the Earth*

*Towards a Sustainable Agriculture, Forestry and Climate is* a non-profit organization incorporated to disseminate ideas and practice about soil remineralization throughout the world. Membership and donations are tax-deductible. ***Remineralize the Earth*** networks to a community grass roots network that stretches to every continent.

Thank you, members and readers for your contributions: results of remineralization, photos, articles, experiences and initiatives dedicated to soil remineralization for ecological and community sustainability – this publication is a reflection of all of you.

**Become a member.** Membership includes three issues sent periodically (aim 3 per year ). Funding and support are needed to expand this work and its international outreach. Please join with us.

**$15 Student/unwaged membership**

**$25 Individual/family membership**

**$30 Subscrption outside the U.S.**

**$50-100 Organizations/corporate**

**$250 Supporting membership**

**$500 Patron membership**

*Contributions over $15.00 are tax deductible.* ***Remineralize the Earth, Inc.*** *is a 501(c)#3 tax-exempt organization.*

---

**Membership includes 3 issues U.S. First Class, Air Mail outside the U.S.***
**Send check payable to: *Remineralize the Earth*, 152 South Street, Northampton, MA 01060-4021, U.S.A. Please print clearly. Thank You.**

**Name/Company /Organization** _____

**Tel** _____ **fax** _____ **e-mail** _____

**Street/Box** _____

**City** _____ **State** _____ **Zip** _____

**Country** _____

**Membership** **$15**___ **$25**___ **$30**___ **$50**___ **$100**___ **$250**___ **$500**___ **Other $**___

**$25.00 membership includes being in the Network Listing of the magazine.**
**WOULD YOU LIKE TO BE PART OF THE NETWORK LISTING? Yes___ No___**
**A brief description:**

# Research Packets - Price List

### Complete Set for Both Agriculture & Forestry/Sewage Sludge

___ $25.00 First Class-Mail Priority
___ $28.00 Air Mail Canada and Mexico
___ $36.00 Air Mail International
___ $27.00 Surface Mail International

### Agriculture Packet

___ $17.00 First Class-Mail Priority
___ $15.50 Third Class
___ $18.00 Air Mail Canada and Mexico
___ $22.00 Air Mail International
___ $17.00 Surface Mail International

### Forestry/Sewage Sludge Packet

___ $12.00 First Class-Mail Priority
___ $10.50 Third Class
___ $12.00 Air Mail Canada and Mexico
___ $17.00 Air Mail International
___ $12.00 Surface Mail International

### *Supplement Available from Don Weaver*

*Solar or Ice Age? Further Insight and Perspective on Global Climate Change* and *More Interglacial-to-Glacial Weather Extremes* in a spiral bound cover, 20 pages.

___ $5.00 First Class within the U.S.

___ $6.00 Air Mail Canada and Mexico

___ $7.00 Air Mail International

***Please send a Postal Money Order in $U.S. if possible to avoid excessive bank charges on both sides. If not possible, Canadian orders must be in U.S. funds. Other international orders must be in U.S. funds drawn from a bank designating a U.S. branch.***

*Reforesting with SR to stabilize the climate – Joan McLaughlin (bottom right) in a Klinki forest in Costa Rica.*
*Read about the Klinki Forestry Project on page 14.*

**REMINERALIZE THE EARTH**

**152 South Street**
**Northampton, MA 01060-4021 U.S.A.**
**413-586-4429 ◆ fax 413-586-6064 ◆ ReminEarth@aol.com**

*With a natural mixture of finely ground river, sea-shore and glacial gravel, forests and soils are remineralized and regenerated. Remineralization strengthens growth and resistance to pollution and acid rain in trees, invigorates all plant life and greatly increases the nutritive value in food.*

***Betsan Coats***

☛ ***Please Renew*** **– If your address label says that it is time to renew, this is your last issue. Please fill out the form on page 55 and mail it to us. Thank you for your support of *Remineralize the Earth!***